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ORIGINAL ARTICLES.

INFANTILE SCORBUTUS.

BY THOMAS MORGAN ROTCH, M.D.,
OF BOSTON, MASS.

THE following cases of infantile scorbutus are reported for the purpose of impressing upon the profession the great care which should be taken to differentiate between an advanced bone lesion of this disease and the bone lesions which arise in osteomyelitis and osteosarcoma.

Case I.—A boy ten months old was sent to the Children's Hospital on February 8. The family history was negative. He was born at full term. He had been fed on cereal milk and gained in weight until the present illness began and had seemed perfectly well.

For two weeks before entering the hospital the right lower leg seemed tender, and four days before entrance a swelling of that limb was noticed. The child appeared quite ill. He was seen in the out-patient department and sent into the house for acute osteomyelitis.

The skin was pale. There was a marked rosary and enlarged epiphyses of both wrists and ankles. There were two lower middle incisors. The gums were slightly reddened about the base of the teeth, but there was no distinct stomatitis ulcerosa. The heart, lungs and abdomen were negative. The prominent feature of the case was the swelling of the right leg from the knee to the ankle, and this was especially marked above the outer malleolus. The swelling was hard, tense and tender. The skin over it was glazed, but there was no fluctuation. The rectal temperature was 101° F. The blood count at the time of the entrance showed 19,200 white cells.

On February 10 the infant was operated upon. An incision was made through the periosteum and a large blood clot found. The periosteum had been completely dissected off from the tibia. A culture taken at the time of the operation was found to be sterile.

On February 18 a second operation was performed on account of the temperature rising to 103° F. The bone was then found to be loose, and the entire shaft of the tibia came out in two pieces.

On February 28 a third operation was performed, as the child was rapidly growing worse. He had run an irregular temperature and had grown pale. There was an ecchymosis of the size of a quarter of a dollar below the left nipple. The other leg (left) was at this time in a condition similar to that of the right leg on entrance, except that the thigh was chiefly affected, the swelling extending from the groin to the calf. A complete blood examination was then made with

the following result: Hemoglobin, 50 per cent.; leucocytes, 27,100; erythrocytes, 2,400,000.

A differential count of the white cells showed: Polymorphonuclear leucocytes, 68.6 per cent.; small lymphocytes, 23.2 per cent.; large lymphocytes, 7.4 per cent.; eosinophiles, 0 per cent.; myelocytes, .2 per cent.; mast cells, .6 per cent.

The erythrocytes showed marked poikilocytosis. During the count there were seen normoblasts, 15; megaloblasts, 5, showing a severe secondary anemia.

The operation consisted of an incision through the periosteum of the femur. A large blood clot was found and the bone was found to be bare. The child experienced little or no benefit from these operations, but grew steadily worse until March 1, when the surgeons called me in to see the case in consultation. I suggested the diagnosis of infantile scorbutus and ordered orange juice. From that time there has been steady improvement in the condition of the child. Additional purpuric spots appeared on March 20 on each side of the neck, and on April 6 all tenderness had disappeared and the periosteal sheaths were firmer, but had not united to the bone epiphyses. The left leg was still somewhat swollen. The blood count showed a decided change for the better. It was: Hemoglobin, 65 per cent.; leucocytes, 17,800; erythrocytes, 5,080,000. Differential count of 500 cells showed: Polymorphonuclear leucocytes, 67.2 per cent.; small lymphocytes, 21 per cent.; large lymphocytes, 5.8 per cent.; eosinophiles, 6 per cent. Red cells showed very slight poikilocytosis. During the count there were seen only three normoblasts and no megaloblasts.

The child's general condition has improved steadily up to the present time. There are evidences of increased bone formation, as shown by the X-ray. The condition of the blood on May 8 was as follows: Hemoglobin, 80 per cent.; whites, 13,700; reds, 5,370,000. A differential count of 400 cells showed: Polymorphonuclear, 37 per cent.; small basophiles, 43 per cent.; large basophiles, 4.2 per cent.; oxyphiles, 12.6 per cent.; myelocytes, 2.3 per cent.; mast cells, .9 per cent. Stained specimens show very slight poikilocytosis and very slight achromia, otherwise nothing remarkable is seen concerning the reds.

This is presented, not only as representing one of the more severe conditions appearing in infantile scorbutus, but also to show how difficult it is at times for the surgeon to differentiate between infantile scorbutus with subperiosteal hemorrhage and osteomyelitis, also the great value which the use of the X-ray is in such differential diagnosis.

Case II.—A boy nine months old came to the out-patient department October 3, 1901. He

had been fed for the first five months on Mellins' Food, and for the last four months on Cereal Milk. His birth-weight was 7½ pounds and his weight at the time of the first examination was 9 pounds, a gain of 1½ pounds in nine months. The family history was negative.

The four weeks before entrance he became

onset of the symptoms, the baby was seen in the out-patient department of the Children's Hospital. It was emaciated. The anterior fontanelle measured 1½ inches. There were two lower incisors and there was a general enlargement of the lymph nodes. The gums showed a slight purplish tinge, but no typical stomatitis



CASE I. Infantile scorbutus. X-ray.

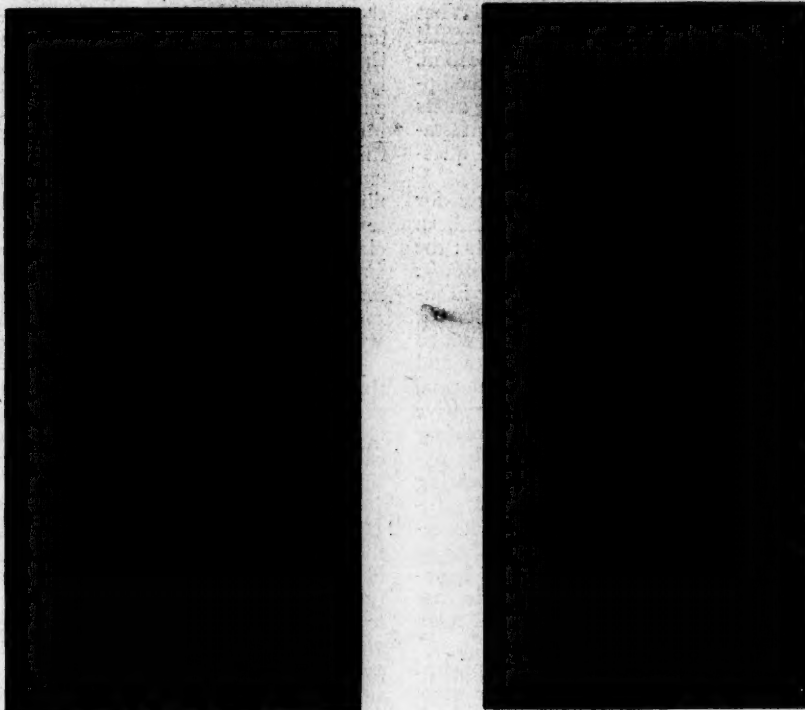
fretful and irritable and the lower extremities became sensitive. One week later the left thigh began to swell, swellings appeared just above the ankles and a few days later the right thigh became similarly affected. The swelling of the thighs progressed. The mouth was red and sensitive, while the baby was cutting two lower incisors.

On September 26, about four weeks after the

ulcerosa. There was a marked rosary. The spleen was just palpable and the liver was palpable two fingers breadth below the costal border. The prominent feature of the case was the marked enlargement of the thighs, in contrast to the emaciated body, especially the arms. The swellings extended from epiphysis to epiphysis, being especially prominent anteriorly. There was no limitation of motion in the joints. The swellings were

apparently connected with the bone; they were hard and tense and somewhat tender, but showed no heat or redness. There was no edema of the subcutaneous tissue. Above the left inner malleolus was a similar swelling, much less advanced. The blood showed 7,400 leucocytes. There was no pronounced pallor. The right thigh measured

significance. In the first place, before the treatment was begun, the right thigh showed not only considerable enlargement, was unyielding to pressure, and so hard that it strongly suggested the presence of osteosarcoma. The case, therefore, was a difficult one in which to make a differential diagnosis, and it had even been suggested by



CASE II. Infantile scorbutus.

8¼ inches, the left thigh measured 7¼ inches. The treatment consisted of plain cow's milk, properly modified and orange juice.

Subsequent History.—There was considerable difficulty in adjusting the food to the infant's digestion, but the swelling and tenderness of the legs rapidly diminished in spite of the persistence of more or less indigestion. At the end of four weeks each thigh had diminished nearly two inches in circumference and there remained no evidence of any swelling or tenderness. The weight was still 9 pounds, but from that time the baby began to gain on a fat, 2.50; sugar, 6.00; proteids, 1.00; 15 per cent. alkalinity; 10 ounces barley water in a 40-ounce mixture. Six feedings of 6 ounces, gradually increased to 8 ounces.

In seven weeks the infant had gained 3¾ pounds. The food was then rapidly increased in strength and quantity, and in the following March, 4½ months after the beginning of treatment weighed 17 pounds, a gain of 9 pounds.

The history just given was that of an advanced case of infantile scorbutus. There were certain points in the case, however, which are of great

some who saw the case that an amputation for osteosarcoma would be needed. It is presented as a condition, which, without the use of the X-ray and with the absence of other symptoms of scorbutus and apparent lesions in the other limbs which may occur in infant scorbutus, would make the differential diagnosis between osteosarcoma and subperiosteal hemorrhage very difficult.

NOTES ON EXPERIMENTAL SURGERY: A MODIFICATION OF THE M'GRAW ELASTIC LIGATURE.

BY J. W. DRAPER MAURY, M.D.,
OF NEW YORK.

THE following report is of work done by the authorization of the Department of Surgery of Columbia University. Its execution was rendered possible by the courteous co-operation of Professor John G. Curtis, who placed the matchless equipment of the physiological laboratory at my disposal and in every way fostered and furthered the work.

It is scarcely possible to consult any authorita-

tive modern article on gastric surgery which does not deal either with the problem of the relationship of gastric ulcer to carcinoma or treat its subject-matter under the assumption that this relationship is established. The most recent views, indeed, hold not alone that ulceration is the most important etiological factor in the production of malignant gastric neoplasms, but that it is the prime causative factor in the development of the so-called "simple diseases" of the stomach. What future observation will determine to be the actual facts in this matter is an interesting question. Enough is now known, however, to make the operative treatment of gastric ulcer, whether in its acute form or in its late and protean manifestations, one of the most important medical questions of the day.

Two widely different operative procedures for the relief of identical gastric lesions have been introduced almost to the exclusion of others: the one is pylorotomy, the other gastro-enterostomy. Opinion is at present divided as to whether in intractable cases of chronic ulceration, more lasting good will be conferred by pylorotomy, which implies a removal of the ulcer-bearing area and a re-establishment of the channel in its normal position, or by the somewhat more conservative operation of gastro-enterostomy, which, creating an entirely new path for the food, puts the pyloric region out of use, places the ulcer-bearing region at surgical rest and allows it to heal. Inasmuch as there are considerations, both immediate and remote, bearing upon the choice of these operations, some of which are as yet of a hypothetical nature, it does not seem probable that either is likely to supersede the other until these questions shall have been set at rest.

Gastro-enterostomy is frequently accomplished by the well-known "Murphy button." The great utility of this instrument is widely recognized, but, unfortunately, its most ardent advocate cannot say that its use is danger-free. In reply to a recent inquiry, Dr. John A. Wyeth writes that he was obliged to re-operate not long since, 120 days after he had used a Murphy button in doing a gastro-enterostomy. After gastrotomy and removal of the button from the stomach the patient died. Numerous similar instances are recorded of disaster due to the retention of the button after it had successfully accomplished its work. Nor is it free, as recorded by Moynihan, from the immediate danger of perforation, quite aside from that of subsequent obstruction. It seems, therefore, important, that some method, equally certain in its action, but less dangerous in its possible sequelæ than this most ingenious device should be contrived. Obviously such a device must "punch out" the juxtaposed parts as freely as the "button," because failure to do this is undoubtedly a factor in permitting the partial or complete closure of the gastric enteric fistula. The ultimate cause of this contraction is not yet known and it offers a very fertile field for investigation.

About ten years ago, Dr. Theodore A. Mc-

Graw, of Detroit, described a very simple method of making enteric anastomoses. It consists simply, to quote his own words, of "A Lembert stitch and a ligature." After choosing the parts through which the opening is to be established the operator places a row of Lembert stitches so as to join the surfaces for a distance of about one inch and a half. A stout elastic ligature, threaded on a round needle, is then passed into one viscus near the beginning of this suture line and out near its termination. Similarly, the needle transfixes the opposite organ and the ligature is then tightly tied. The Lembert row is completed and the parts replaced. The elastic cuts its way through in from two to three days. Obviously, neither this technic nor any modification of it could be employed for the relief of complete obstruction, although it is probable that a certain amount of leakage must take place some time before the elastic is liberated. Here again there is need of further observation. There exists, however, a large class of cases in which the establishment of an opening is not an *immediate* necessity, and in which delay may be of positive value.

That the ideal technic is not yet reached and that a spirit of unrest and uncertainty is rife is evidenced by the following quotation from Dr. Geo. R. Fowler: "It may be that further experience will show that the use of McGraw's elastic ligature will prove of use in respect to both the jejunal reflex and the occurrence of shock and collapse as well as the possibilities of infection, since the period of time occupied by the elastic ligature in completing the anastomosis, namely, from forty-eight to seventy-two hours, corresponds closely to that in which vomiting is mostly to be feared, and the rapidity with which the operation can be performed and the cleanliness which it makes possible guard against shock and infection. I confess, however, to a feeling respecting the elastic ligature, akin to that expressed by Codivilla, who, speaking of the use of the Murphy button in gastro-enterostomy, said: 'Its good function is always in God's hands.'"

That the ligature, when applied in accordance with McGraw's technic, gives excellent primary results, however, is hardly to be doubted. It has been practised successfully by men of the highest standing quite aside from the numerous times it has been employed by its distinguished inventor. In a recent letter Dr. McGraw says: "I have heard again from Dr. A. J. Ochsner, of Chicago. He has just operated on his sixth case, the other five having given most satisfactory results."

Are these immediate results to be permanent? Undoubtedly Dr. Weir voiced a general criticism of the method when he said that he had feared to use it because it did not "punch out." He believes that although the opening may be made practically as long as the operator desires, its patency may be effected by the growth of bands forming bridges from one side to the other. This seems a very plausible hypothesis, since, for considerable periods, the raw edges of the slit must lie in apposition, and such bridges, if formed,

would in time narrow the lumen to a useless fistula.

In April last the writer began a series of laboratory experiments which aimed at finding a method so to place the elastic ligature that it *would* "punch out." Rabbits were first used, but they died from shock or from obstruction—the gut being too small to work upon satisfactorily. Dogs, however, reacted admirably, and although, as is well known, successful work with their gut does not always imply that like results will follow the employment of like technic in the human intestine, because of the great dissimilarity of the organs, conclusions of a presumptive character can be reached by this means.

Dr. McGraw kindly furthered my efforts by sending a dozen of his ligatures which are made to his partial satisfaction by Messrs. Nelson Baker & Co., of Detroit. These gentlemen hope shortly to offer an elastic somewhat smaller than the present one and as strong. The ligature now on the market may be described as follows: It is a black circular band, almost a foot long, and so sharpened as to be easily threaded on a flat-eyed needle.

Fig. 1.



Dog's Stomach—one of the early specimens—the bands referred to are seen uplifted by rubber tubes. The lumen in the specimen was larger than is shown in the photograph, where it appears as a small slip because of the presence of the tubes. A cm. scale is appended.

It will stretch over six times its length and is virtually unbreakable with the ordinary force of the fingers.

In the preliminary experiments the elastic was so placed that some excellent results were ob-

tained in that an irregular opening was always made. In every case, however, two bands of tissue stretched directly across the opening—as seen in Fig. 1—two bands of mucous membrane from the gut and stomach pass over two rubber tubes.

Fig. 2.



Crinoline model showing the method of applying the stitch.

The bands are at right angles to each other and partly occlude the lumen. The manner in which this tissue came to be left was never worked out and although each semicircular opening could be made, at will, larger than the pylorus, the technic was evidently defective, though not to be unreservedly condemned.

Mr. Edward Cussler and Mr. J. S. Thomas, both juniors in the medical department, assisted me throughout, and it is a pleasure to state that the further and apparently successful modification of the McGraw technic was made by them. It is a further pleasure to state that without the hearty co-operation of Mr. John T. Hoyt, of the Physiological Laboratory, this work could not have been carried on so successfully.

Fig. 2 shows a sketch of a model in crinoline of the stitch as modified by the students. The point of view is from the mucous surface of either the gut or stomach. The four sides of the rubber square which are seen, lie directly upon four corresponding sides of a similar square in the opposite and juxtaposed organ. How such a stitch can fail to "punch out" as much as may be desired is not clear, although the experiments made are by no means sufficient in number to justify more than conservative claims for it.

If, after passing such a stitch, the parts are gently separated so as to show three of the four corners of the square, it will be seen that at each point and virtually through the same hole the ligature passes twice. If the sides of the square be made 3 cm. long it will be noted that unless the intervening tissues between the angles be held in close apposition, there will be danger of leakage. In using a square form of the stitch, then, it is absolutely necessary to protect the part with a continuous or an interrupted Lembert stitch. If an octagonal form be used, the need for such protection would be more remote because this would double the number of through-and-through stitches and give intimate junction of the apposed serosa, simulating the conditions established by the use of the "Murphy button."

The following is a technical description by Mr. Thomas of the method of inserting the liga-

ture: "It is possible at will to make the opening a triangle, square, hexagon or octagon. A square provides, to all intents and purposes, a circular opening. It was used in all save a few of the later experiments. The detailed technic

Fig. 3.



Dog's Stomach with section of jejunum attached—the latter split open to show its mucous membrane. The preparation was hardened in formalin—a cork which dropped into the fistula by its own weight having been inserted to prevent shrinkage.

of insertion is as follows: Decide on the size of the square desired, and, after approximating the surface, gut and gut or stomach and gut so that there may be no unnecessary tension, place a Lembert stitch of silk to join the two viscera at each of two points destined to be the diagonally opposite angles of the completed square. These stitches will hold the parts together and will serve as guides for the introduction of the ligature. The needle is introduced into one of the apposed viscera at a point selected for one of the remaining angles and brought out beside one of the guides. From here it is passed through the opposite organ, care being taken that the needle thoroughly pierces the mucous membrane—which is somewhat resistant in a dog but not so in a pig—and out again at a point diagonally opposite the starting place. From this point to the point of beginning the steps are directly reversed, viz.: the needle re-enters the first viscus, emerges at the first guide, re-enters the second viscus and emerges as nearly opposite the starting point as possible. The stitch is then just

half done; two sides of the square are completed, and the arrangement of the elastic ligature may be correctly represented by a figure 8 bent in the middle. The remaining two sides of the square are completed in the same manner, care being taken to make the distal loops of the two figures of 8 interlock."

In the earlier work with this stitch the ends of the elastic were tied with fine silk, precisely as recommended by McGraw; but, recently, it being found how firm a knot could be tied with Senn's iodized catgut, and that it would not slip, this was substituted for the non-absorbable silk. No. 2 gut was found to hold the ligature long enough to allow it to "punch out;" then absorption of the gut freed the knot and allowed the elastic to uncoil. The result was simply that the

Fig. 4.

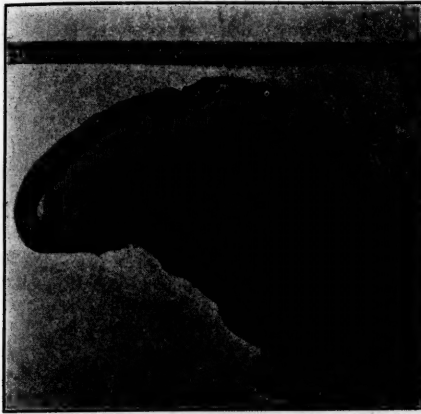


Dog's Stomach showing a small portion of mucous membrane, the pylorus and the attached duodenum. A window has been cut in the gut showing a hexagonal opening into the stomach. This specimen was filled with one-per-cent. weak formaldehyde solution, and the extremities tied. The relations of the lumen to the gut are therefore preserved in just proportion.

ligature, when passed by rectum or when vomited (one case) came out perfectly straight (see Fig. 5), looking much like a bit of old-fashioned slate pencil, 5 cm. long. There may be no merit in this, but a straight piece of elastic in the alimentary canal might be even less objectionable

than one coiled and knotted. Furthermore, it is thought that the liberation of the elastic will be a factor in preventing its adherence to the mar-

Fig. 5.



Dog's Stomach, showing duodenum and quadrangular opening. Size shown by cm. scale.

gin of the fistula as was noted in several cases operated upon by the McGraw technic as well as by our own. This retention of the ligature is a factor which merits further observation, and sug-

Fig. 6.



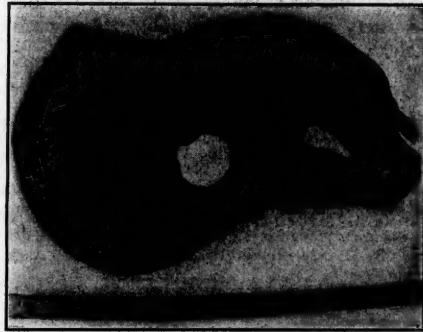
Dog's Stomach seen from mucous surface. Five openings are shown, three of which are the cut ends of the pylorus and the gut—the fourth being the pylorus, and the fifth, the fistula.

gests the possibility of doing away with the elastic altogether and using heavy iodized gut in its place. This, if practicable, would indeed be ideal—the utilization of an entirely absorbable

material which would vanish as soon as its work was done. Further experimentation will determine this point.

The time consumed in taking the stitch varies very naturally with the experience of the operator. To make a square consumes, perhaps, twice the time necessary to place a "Murphy button" or the simple McGraw stitch—probably a little less than the ordinary method of section, excision and double ligation. It appears, therefore, that no objection can justly be made to it, since the time requisite for its performance falls within reasonable bounds. Furthermore, it is no doubt true that if we have had but little trouble in placing the stitch in the tough elastic viscera of dogs, hands more expert than ours should experience less annoyance and less delay in inserting it in the more easily handled human gut. That this may be true is shown by the ease with which the ligature was placed to form a triangu-

Fig. 7.



Dog's Stomach seen from serous surface, showing a very satisfactory opening.

lar entero-anastomosis as well as a quadrangular gastro-jejunosomy in a pig weighing 120 pounds. [The pig is fed on the refuse from the hospital and has since gained eighty pounds.]

Autopsies have been done on seventeen dogs. Three dogs, with the pig, will be kept until fall, to form, if possible, the nucleus of a further report. Of seventeen dogs in which elastic ligatures were placed in a variety of positions; straight, cruciform, triangular and square, some with and some without burying Lambert sutures, six died. One perished from intestinal obstruction due to a band situated at a distance from the site of operation, and probably caused by rough handling; two, in which no protecting stitches whatsoever were used, from perforation at the site of ligature, showing the imperative need of such support; two from pin-point perforations of the gut, due to bad technic, one from sepsis (3½ months) from a localized stitch abscess. While it is not intended that this incomplete report shall form the basis of any mortality comparisons, it is not without interest to note that there were no deaths

in those cases where the ligature was applied in conformity with accepted rules of enteric surgery, which might not have occurred in the execution of any other technique.

From this too small and confessedly incomplete series of experiments the following conclusions suggest themselves:

1. The McGraw Elastic Ligature can be so inserted as to "punch out" as large an area of the juxtaposing walls as may be desired, with at least as much certainty and with greater safety than the Murphy button.
2. That the margins of such openings are smooth and not unduly cicatrized.
3. That the elastic ligature may remain in situ after punching the openings, although this is less likely to happen if tied with iodized catgut.
4. That such retention in the mucosa of so soft a material is not apt to be harmful or permanent.
5. That the time required is not sufficiently increased to render the use of this technic impractical.
6. That perhaps enough has been suggested to stimulate further research by others, so that the actual facts in these most interesting problems may shortly be brought to light.

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Influence of Diphtheria and Tetanus Toxin upon the Blood.—It was found by H. KUCHARZEWSKI (Centralbl. f. Bakt., Vol. 34, No. 4) that tetanus toxin diminishes the number of red cells and the amount of hemoglobin. Large doses also diminish the density of the blood. A hyperleucocytosis is also noted but not so marked as that with diphtheria toxin. It is not to be ascribed directly to the amount of toxin injected, for there is first a period of hypoleucocytosis. The number of pseudo-eosinophiles is increased while the lymphocytes and eosinophiles are always diminished. The proportion of large mononuclears and intermediary elements does not vary from the normal. When the toxic substances were destroyed by prolonged heating, these blood-changes were not noted, which proves that they are solely due to the toxins and not to the culture medium.

A PROPOSED APPARATUS FOR THE TREATMENT OF EMPYEMA.

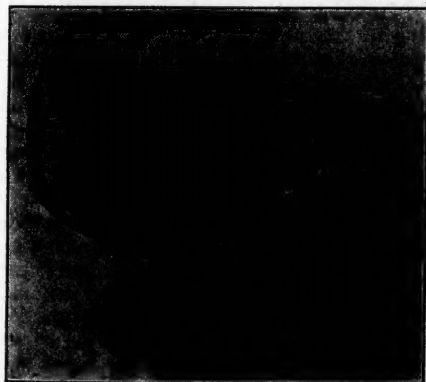
BY FRANCIS M. C. USHER, M.D.,
OF PORT YELLOWSTONE, WYOMING.

IN the whole domain of surgery no branch thereof has reaped greater benefit from the introduction of antiseptic and aseptic methods than that part which relates to the surgical treatment of pleural effusions. Nor, indeed, has the application of modern methods of diagnosis secured more gratifying results; what once was in doubt can now be accurately determined by the aspirating needle, microscope and culture tube, and cases which were formerly doomed are now given reasonable hope of cure through proper surgical intervention. One of the first effective steps in this direction was the introduction of the vacuum aspirating apparatus whereby pleural effusions could be drawn off with the minimum risk of introducing air into the pleural cavity and thereby possibly contaminating and changing a simple effusion into a purulent one. In uninfected effusions this method of aspiration, repeated if necessary, will very frequently effect a cure, especially in the young. In infected effusions, however, the procedure in the end must be radically different; pus in the pleural cavity like pus anywhere else, must have free and continuous drainage before an effective cure can be hoped for. This of course necessitates an opening into the pleural cavity and establishing free communication with the outside air. The moment, however, that the visceral layer of the pleura is subject to the constant pressure of one atmosphere there arises a purely mechanical problem which has been but unsatisfactorily overcome, and which in itself is the prime cause of the unsatisfactory results following thoracotomy and the subsequent performance of the mutilative but necessary thoracoplastic operations. The lung containing elastic tissue, on the stretch at all times except in forced expiration, maintains a pull of about one-quarter pound to the square inch on the inner chest walls and diaphragm, which, being air-tight and sufficiently rigid, hold the lung in apposition to them. When an opening is made in the chest wall this negative pressure between the two layers of the pleura no longer exists and the lung is free to contract to the extent of the contractility of its elastic tissue. This it does when a thoracotomy is done for the purpose of drainage of pus. Moreover, during the course of time necessary for the cure of the abscess, the contracted lung becomes coated with plastic lymph and young connective tissue, which not only tends to contract the lung further, but, later on, when the abscess cavity has healed and the external opening has closed and the contained air in the old abscess cavity has been partially absorbed by the bodily fluids, leaving a partial vacuum, as it were, the lung being bound down by lymph and connective tissue is unable to expand and fill the rarified space. This causes displacement of the viscera and sinking in of the chest wall to obliterate the space. The deformity caused by this

may demand a thoracoplasty, which, most likely, has already been called for to coapt the chest wall to the collapsed lung, in order to cure the abscess. The rational way it would then seem to treat empyema, so that thoracoplastic operations would not be required, would be to maintain throughout the treatment the expansion of the lung and at the same time effect continuous drainage. The ac-



companying cuts show an apparatus that I have devised, which has this for its object. It consists of a metallic or glass box "1" of about 300 c.c. capacity, with top and bottom screw-threaded perforations, a perforated, nipplescrew-top "2," a perforated screw body flange "3," and a section of pure bandage rubber of suitable size "4." The application of the instrument to the body is effected by fitting the hole in the center



of the rubber the screw of the body flange and then screwing the flange to the drainage box, making an airtight junction between the rubber and the instrument. The under surface of the rubber is then cleaned and roughened with emery cloth and a coat of rubber cement is applied and allowed to dry, the corresponding surface of the body over which the rubber is to be applied is also cleaned, coated with cement and allowed to dry. On application of the rubber to the body it

will be found to adhere very tightly, making an airtight junction between the instrument and the body. If now the top is screwed on and connected with an exhaust pump by means of a rubber tube fitted over the perforated nipple, the air partially exhausted and the rubber tube tied, the instrument can be worn with comfort and will maintain a partial vacuum for an indefinite period. The diameter of the hole in the body flange is $1\frac{5}{8}$ inches and the incision for the resection of the rib would best not exceed it, in order that the wound may be at all times accessible for inspection. With the resection made, the apparatus attached, the drainage tube would lead into the cavity of the box, which is filled with gauze, the top screwed on and the air exhausted, the operation would be complete. By unscrewing the top the dressings may be removed as often as necessary. The amount of suction to which a diseased lung can safely be subjected is as yet undetermined. The amount which would overcome the elasticity of a normal lung would be very small, 10 to 20 mm. Hg. The amount of rarification in the instrument could be approximated by having the nipple tube collapsible at a given atmosphere. The theoretical advantages of this method of treatment, besides those given, would be, that the expanding lung would assist in the drainage of the pus, the lung perform its normal function and the negative pressure between the pleura be re-established and maintain its aspirating effect on the venous circulation. The apparatus would of course be useless if the pleural abscess communicated with a bronchus. Its use would best be suited to early cases, and by its preventing the collapse of the lung the usual hesitancy about making an opening into the pleural cavity would be overcome. I regret that I have not had an opportunity to put this method to a practical test, and publish this description with the hope that some who may be interested, and deem it practicable, may give it a trial.

THE ADVISABILITY OF A MORE DEFINITE COURSE OF INSTRUCTION IN PHYSICS IN THE MEDICAL CURRICULUM.*†

BY ALLEN J. SMITH, M.D.,
OF GALVESTON, TEXAS.

I WOULD preface the matter of argument by calling attention to a mental attitude very common in medical students, the aptness to regard the mere gaining of a diploma as the summum bonum of a course of study—a habit of thought which unfortunately is capable of being carried forward into the medical practice of the physician in viewing the possession of a diploma as justification of whatever lack of skill and practical inefficiency may be exhibited in his professional life. There are of course many exceptions to the unfortunate truth of such an assertion; but in the minds of

*From Laboratory of Pathology, Medical Department of University of Texas, 1903, No. 4.
†Annual Address of Chairman before Section of Pathology, Texas State Medical Association, San Antonio, Texas, 1903.

those accustomed to deal with large numbers of medical students the reality, however it may be regarded, of the first part of this proposition can scarcely fail of recognition; and it needs no long search in the great body of our profession to find ample evidence of the second. In fact there lie at the bottom of these mistaken purposes and opinions so much of common human nature, so many of the temptations of an artificial strenuosity of life which has never more than now prevailed in our country, that indeed it is a matter for wonder that such faults of preparation and evasions of responsibility in action are not more numerous than they really seem.

Granted the truth of such statements it naturally follows that in the mental processes of individuals of such type there should be exhibited the equally faulty wish and effort to obtain the desired diploma and such license as it may afford at the least possible expenditure of energy, time and other valuable consideration; and in whatever feature of preparation for medical practice there appears opportunity for evasion of difficulty, of conservation of mental effort and temporal and financial convenience, in that phase of the educational course of the individual such evasions are likely to be practised. Naturally, too, in those subjects of the curriculum which do not on their face bear evidence of their immediate relation to future professional requirements are likely to be concentrated these attempts at evasion; and thus it comes to the untrained, unadvised or ill-advised student of medicine that he should regard all his studies and exercises dealing with the so-called preliminary branches of medical training as unproductive, relatively valueless and undesirable, and justly to be neglected when opportunity obtains.

Of the branches of the medical curriculum or preparatory to it which in the experience of the writer are regarded by this type of student as veritable bug-bears, *physics*, *chemistry* and *general biology* probably occupy the first rank, and probably among themselves stand in the order given. That there are reasons for the widely prevalent views of this sort among our classes is not of course to be doubted; but it is not my aim to recognize and discuss such reasons. Moreover, I do not wish to attempt to show reason for insistence by medical instructors upon thoroughness of study in all of these branches of science by our classes. Both chemistry and biology seem in a fair state to prove to even the most unthinking their absolute necessity to the really competent physician; and in fact need neither defence nor laudation. Chemistry at one time shared with anatomy in its all-pervading dignity in the medical curriculum, but rather from its relations with compounding of remedial agents than with either physiology or pathology. With the division of labor between physician and pharmaceutical chemist the older value of chemistry grew less and less in the appreciation of the first; and, eventually, had it not been for its ancient predominance and the value of occasional applica-

tions in symptomatology (especially of the urinary diseases) it would doubtless, with botany, have been entirely relegated to the pharmaceutical curriculum as non-important to the medical man. But here as in all human habits of thought there is a pendulum swing, now carrying back to its old prestige the study of chemistry, changed, it is true, in the type of its presentation and application, but each year recognized more and more in the form of physiological and pathological chemistry as one of the undeniable and main supports of our best medical knowledge. It is safe to say that within another generation physicians who are not also competent chemists will occupy just as little advanced position in the profession as do those now who are incompetent microscopists. The widespread interest in nature studies, reaching well down into the lower grades of our common schools, is sufficient assurance of the final position which general biology, at least as a preparatory branch, must bear for those who look forward to a life in medicine.

It is no great wonder that ancient and medieval physicians were not also physicists as they were chemists, when we recall the crude ideas and limitations of the general subject until comparatively modern times—the really modern establishment of such basic ideas as the true relation of the earth in the solar system, the rotundity of the earth, the law of gravitation, the control of electricity, the mechanics of steam, the conservation and transformation of energy, the vibratory theory of force and a host of cognate matters, to say nothing of the discovery of the circulation of the blood, the cellular structure of the body and the cellular theory of disease.

In the manifold applications of the principles of physics in modern everyday human life men of a score of specialized professions are employed; yet nothing of the intricacy of construction and specialization of parts, of coordination of each to the whole, often inferred rather than clearly seen, in the mechanism and function of the animal body can be realized in the entire group of the engineering professions. There is not a single branch of the medical course of study, moreover, which does not in recognizable way and degree call forth, directly or by analogy, the fixed principles of physics as clearly as in any engineering problem. The architectural ingenuity of man is barely comparable, if at all, to that shown in the adaptation of material for strength in the construction of bone, in the distribution and limitation of strain in the human skeleton; the principles of hydrostatics and of hydrodynamics with a system of compensations witnessed in the circulations of the body are applied with more intricacy and exactness than seen in the highest engineering accomplishments in connection with any of the waterways of the globe; the development and coordination of gross and minute movements of the body and its parts exhibit a desideratum for mechanical engineers to be envied but not to be attained; the production and maintenance in uniformity of the body temperature in all the varying conditions of

the body itself and its external relations in comparison with our best artificial means of heat production and regulation are as more than the work of the master to the work of the child; the complexity of the factors of physical and chemical processes operative in secretion and excretion renders the actual method almost a sealed book to the physiologist, but no man's machine is inscrutable to his fellows; the simplicity, convenience and effectiveness of the ocular and aural apparatus render our eyes and ears models to be approached but not attained by the ingenuity and skill of human inventors and mechanics; while the vast system of nervous paths and centers of the animal body may have an analogy in the most complex electric arrangements of men, the whole world of electric systems compacted in one mass can scarcely rival the delicacy, multiplicity and infinite accomplishments of the nervous apparatus of one human body.

That a branch of science having such elaborate relations with the animal body in health and in disease should find little and often no definite representation in the medical curriculum is from the first serious thought in itself marvelous. Perhaps the complexity of its bearings in medicine and the profundity of its relations to life phenomena stand as a first excuse for this most significant failure. Let this be so; it is no argument. Even Alexander's little world was not conquered in a day. No matter the magnitude of the whole, each part apprehended is a gain to human knowledge and somewhere has its practical application; part by part, every portion fixed upon the student's mind makes of him one better prepared to work out further problems for himself and for the rest of us. Nor am I unaware of the fact that these principles are here and there at the present time being given in one or other of the existing branches of medical study; but a part here and another there are by no means the same as a careful and definite résumé of the science and its scope of application to our needs; and further, those branches now working out these problems, as from time to time needed in elucidation of their own difficulties, are doing preparatory work, from which there is every reason to excuse them if we would wish them their fullest development in a speedier time. The ophthalmologist goes over a course before his class explanatory of the physics of light and lenses; the microscopist prefaces his instruction by a somewhat similar outline; the aurist discusses the vibrations of air and solids in the development and transmission of sound; the physiologist, the diffusion of gases, the laws of osmosis, questions of hydrostatics and hydrodynamics and practically every other subject pertaining to the branch in the explanation of a great number of instruments of precision and in elucidating that which is known and conjectured as to the various bodily functions; the obstetrician, the resultants of forces applied variously, successively and coordinately in directing and accomplishing the birth of the child—in short, each instructor takes up before

his class some part or parts of a subject of fundamental importance to all and deserving an individual and dignified position in the scheme of instruction; and each loses just so much of his time and opportunities to press a little further toward his assigned object in the general plan.

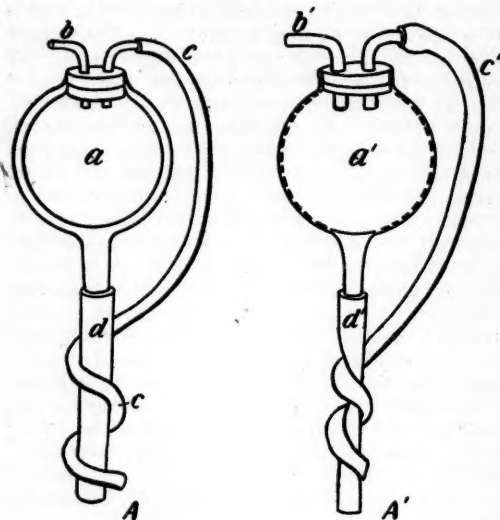
What would I make of physics in the medical curriculum? To the writer's mind the branch has a direct and particular phase of application which is spoken of as *medical physics*. For the student who has had no training in the subject when admitted to the medical school I would insist upon a course of lectures or text-book study with actual demonstration covering the general principles, and for all students laboratory exercises designed to familiarize them with the principles and actual manipulation of the various instruments used in experimental and in practical medicine, and to illustrate by experiment and attempts to mechanically reproduce outside the body by simple models such phases of nature's operations as may thus be copied. The latter part of the scheme, the distinctively medical physics, should be further elaborated according to the wish and ability of the instructor, by lecture or other mode of explanation, in indicating the multiplicity of factors and their mutual relations in the accomplishment of bodily functions, with immediate and direct reference to the influence of modification or loss of any factor toward the development of disease and its symptoms.

The matter of the construction and mode of handling of the various instruments used in experimental and practical medicine needs no explanation or illustration of its value to the student; and the release of the instructor from the necessity of discussing fundamental principles involved in his branch will doubtless be accepted as affording more chance for increased attention to and development of the particular features of his special subject. Dealing with those students who have attained the general ideas and a fair technic, the physiologist, the pathologist, and particularly the clinical physician and surgeon or obstetrician have fair field for presenting the final problems of their branches, the ultimate objects of instruction.

The student is taught that glandular secretion or excretion is dependent on the presence in the gland of more or less freely circulating blood as the source of the particular substances elaborated by the gland. He witnesses a *case of acute renal suppression* in the hospital ward and later at the autopsy meets with a deeply congested, red and swollen kidney. Will it help his appreciation of the development of the symptom if his thoughts be directed along some such line as follows? Setting aside for the time but in no way denying the importance of selective cellular activity, the mechanical forces and methods involved in urinary excretion are brought forward in greater prominence. The structure of the kidney speaks for filtration as at least one factor in renal activity, filtration of the fluid and more or less of the urinary salines from the blood. For the example in hand it is immaterial what further action the epithelium of

the convoluted tubules may accomplish. One may well compare the renal unit (the Malpighian tuft and its enveloping capsule and the tube leading therefrom) to a separator funnel lined with a permeable membrane and fitted with a compressible discharge tube. My meaning may, perhaps,

Fig. 1.



be more readily apprehended by reference to the diagram (Fig. 1, A) in which is represented an ordinary separating funnel, within which separated by an appreciable space from the inner surface of the funnel is fitted a permeable and expansile membranous sac (a) provided with an entrance tube (b) and exit tube (c) both of the same expansile type as the sac itself, and the exit tube (c) coiled about the compressible discharge tube (d) of the funnel. In a rude way this follows the type of the coiled capillary tuft within Bowman's capsule and the arrangement of its emergent capillary about the convoluted tubule of the kidney. Presuming that the pressure of the fluid within the membranous sac in the funnel (capillary tuft within Bowman's capsule in the kidney) is positive, but insufficient to stretch the sac to close adaptation to the wall of the funnel, the contained fluid will escape through every part of the membrane into the space between the sac and the funnel; and if that pressure be lowered the filtration of fluid will be diminished in rate. On the other hand (Fig. 1, A') if the pressure within the sac is increased (increase of vascular tension in the renal vessels, as in marked sudden congestion) it follows that the sac must expand to become closely applied to the wall of the funnel (the tuft to the wall of Bowman's capsule); whence it is clear that there is opposition to the escape of fluid from the sac save at the limited surface opposite the opening of the discharge tube of the funnel (the beginning of the proximal con-

volute tubule of the kidney). It is to be realized that increased pressure within the sac must be carried forward along its emerging tube (c'), leading to the distention of the latter (providing the same difficulties of discharge as in the tortuous renal capillaries and veins), in this connection the particular feature of its expansion referring to its encirclement of the discharge tube of the funnel (the plexus of emerging capillaries about the convoluted tubules and the general capillary distention within the renal mass). If room for such distention is not given save at the expense of the caliber of the encircled discharge tube (as is the case in the kidney from the pressure of the general renal tissue and the resistant renal capsule) there must result narrowing or possibly closure of the discharge tube (d'), affording another mechanical factor in inhibiting whatever tendency toward filtration may continue in the funnel above; and if the pressure be sufficient through these two obstructions, one may readily infer total suppression of the filtration process. The walls of the capillaries of the Malpighian tuft are by no means entirely comparable to ordinary porous filtration membranes, but in the relation here proposed are at least analogous and in illustration of the mechanical influences named will easily bear the comparison; and silence concerning any part played by the renal epithelium in no wise impairs the illustration. Nor is it difficult to fix in the same bit of apparatus the ideas of the student as to the relation of urinary suppression and hematuria in such cases of renal stagnation from acute congestion.

Another striking example from pathology suggested by the same line of thought concerns the *explanation of the posture assumed by the patient with broken cardiac compensation* and approaching his end. It is invariable that as the heart fails the individual finds himself little by little forsaking his natural low recumbent posture at rest, seeking a higher and higher pillow, and as death approaches finding comfort only in a sitting posture with the limbs more or less elevated; and invariably change from this position to a lower or higher (more erect) attitude calls forth evidences of special cardiac effort. There are here, of course, as in most cases, a number of factors to be considered for the full explanation of the whole symptom picture; but of these that of the influence of gravity in distribution of the blood is the element of variation to which mainly must be attributed the symptoms in question. One should realize here that in the erect or sitting posture the column of blood in the aorta and its branches beyond the turn of the aortic arch must by its weight naturally produce no immaterial tendency toward keeping up the usual downward current (other factors of aid and resistance being disregarded for the time for the sake of the argument); while in the recumbent position the distribution of the blood over the whole body is practically the result of the propulsive force of the heart and vessel walls alone. The difference in cardiac labor in these two postures may be roughly stated as the

difference in lifting the column of blood from the left ventricle to the turn of the aortic arch and to the head in the first instance and the lateral propulsion of the whole arterial blood mass in the second. Or, to use a homely simile, it is comparable to throwing a ton of coals, shovelful by shovelful, over a low fence and allowing it to fall fifty feet in a vertical direction in one case, and, in the second instance, to the labor of transporting the same coals, shovelful by shovelful, across a level space for fifty feet and depositing it in a new heap. With such a view it is easily realizable that there is more labor demanded of the heart with the body adjusted in recumbent position than in either the erect or in the sitting posture, and that when the circulation is from many influences already weak and feeble, the added strain upon its walls may well call out marked evidences of its exertions. The sitting posture is assumed rather than the upright in such an instance for easily stated reasons, namely, the usual general muscular enfeeblement of the individual and (in the absence in either position of chance for free muscular and respiratory aid in venous return) the less labor of lifting the venous column of blood through the shorter vertical from the feet to the right heart when the individual is sitting than when standing. This too should explain the common tendency in such patients to keep the limbs moderately elevated when sitting, such elevation being insufficient to occasion much difference in the gravitation of the column of arterial blood but making an important difference in favor of more easy venous return from the limbs (the difference of height of the lower pelvic level and the floor).

These examples of the type of questions to be presented to the student in medical physics are crudely and but incompletely drawn; but they serve the purpose of illustration here desired and indicate the objective aim in urging the adoption of a definite course in the subject. They are both well suited to actual laboratory demonstration but not more than a host of other possible instances. In fact in the arrangement of a course it must be a matter of selection from the great number of examples possible; and the fullest scheme could not possibly deal with more than types, leaving the individual application to the intelligence and resources of the student for determination. It could not do more than attempt to inculcate a habit of thought along these lines, aroused by witnessing typical illustrations; and in the end this is one of the real purposes of every education, the establishment of a method of observation and of mental reflection and application of principles to the clinical problem of the physician. Beyond this the crowded condition of the curriculum would give but little justification for fuller work.

This matter of urging the adoption of a definite system of instruction in medical physics applies particularly to our American medical schools. For a decade or more in Great Britain it has come to be a required study for those applying for the

ordinary qualifications; but in the university courses in medicine and surgery it was demanded for a much longer time. Much the same may be said of the continental universities as for those of the British. In our own country a demand for a certain amount of knowledge of elementary physics as an entrance requirement is common to all the schools holding membership in the American Medical College Association as well as to a number outside this organization. For the most part this requirement is worth nothing or very little better; in some instances the branch is but an elective in these requirements. In comparatively few college catalogues is the amount fixed at any really important grade. Inspection of catalogues shows, too, that in but a very small minority of our schools is there provided any additional work in the medical aspects of the subject; and of these few it is not at all sure in some but that the physics taught is absolutely elementary and rather introductory to chemistry, with which it is usually associated, than an applied medical physics. There are a very small number of American schools in which the catalogues indicate a really commensurate and suitable presentation of the branch, and this number by no means includes all the schools of the highest reputation in the land. Nor does there occur to the writer, in examining the prospectuses of the year or from personal knowledge or information obtainable, that there is any real tendency to remedy what after serious thought he has come to look upon as an unjustifiable negligence.

I confess to a twofold object in this sketchy presentation of what I fear is not a popular subject. The first is of course that of attracting the interest of the members of the association to the importance of medical physics in itself and to its rather common disregard in most of the American schools of our profession; but I have more directly in mind the intimate relations of this Association to the State and its medical school. In the Medical Department of the University of Texas no preliminary knowledge of physics is asked of the student about to matriculate. From early in its history the professor of chemistry, Dr. S. M. Morris, has devoted in the first half of the freshman year two hours weekly to a lecture and demonstrative course in the subject with special reference to its bearings in medical study, but has been unable, principally from lack of space and appropriate equipment to develop the actual and needed laboratory course above suggested. It is unlikely that it will be possible for years to come to demand such a degree of preliminary knowledge of the subject that it might be dropped from the course, were this desirable; since entrance demands from professional schools must in distinct degree depend on as well as lead popular education. It is toward the establishment of a fuller, more practical and more directly medical course in physics in our home school that, in closing, I wish to leave your thoughts, in which wish I know the ideas of my colleagues in the faculty of the school and my own are in accord;

and for which I am in position to know that the Regents of the University, advocates of progress wherever and whenever possible, are powerless, as in many other features of the school where advances and expansions are desirable, solely because of financial disability. I would not ask of you any concerted action in any of these matters, since such action is apt to be transient in its influence and of less value than individual effort; but I would ask of those of you to whom this paper may have appealed as reasonable to use your personal powers and influences to create in our State a popular interest in and willingness for the school to advance not only in the limited lines indicated in this paper but in all lines leading to the highest attainable efficiency.

MENTAL THERAPEUTICS IN MEDICINE.*

BY J. M. AIKIN, M.D.,
OF OMAHA, NEB.

THOSE unsatisfactory cases referred to the domain of neurology and psychiatry by the physician and surgeon constitute a very formidable array of facts we meet and should solve. Admitting our inability to benefit these cases is against the spirit of progress in the medical profession. Our failures are, I believe, more chargeable to the profession than to the patients. This statement is no injustice to our profession, that has studied the body as a physical organism, in the battle against chemical and parasitic disease. Indeed, so interesting, instructive and progressive have these material investigations proved that many simple physiologic facts, clearly within the realm of the mental, are quite forgotten in our therapeutics.

The revelations of bacteriology and microscopy have so engrossed our attention that the action of mind on body and body on mind is almost a lost factor in our art. The interrelation between the physical and mental organism of the individual within physiological limits is common knowledge; when pathological relations exist, medical knowledge is sought.

The everyday effects of the mind on the body in the processes of digestion and assimilation, secretion and excretion, are so obvious they are overlooked in our search for rare and striking effects of mind on body. Since the common effects constitute a decided majority, it will lend us greater assistance if we reckon more closely with them, than with the uncommon, in practising the healing art. We see the physical organism out of balance and proceed to treat our patients as machines to be repaired by physical and chemical remedies alone. I believe it is a fact that the success attending any physician's practice is due in greater measure to the mental impress he stamps upon his patients than to the drugs he gives. Or stating it differently, the confidence he elicits by the patient's faith in his ability to effect a cure will go farther toward relieving the ailment than

would the physical and chemical treatment without confidence in the doctor. Witness the testimonials of patients who frankly tell you your medicines always benefit them, when the same drugs given by another doctor are not only futile but often aggravate the ailment. Calling this imagination with the injunction that the patient take an introspective view of self and adjust his mental organism is admitting the mental factor while shifting our responsibility for treatment to him.

The framework called the body organized with bone, muscle, and nerve cells is but a mass of degenerating tissue when out of touch with mind, the constituents of which are perception, intellect, will and emotion. We know the mental factor is dynamic in producing disease. We know, too, the same force operates favorably in producing health. The blue pill and Epsom salts are noble, obvious, palpable, physical and chemical remedies. Force and boldness are intangible remedies applicable and operative in the mental realm. Why do medical men leave the exercise of force and boldness in therapeutics to the charlatan? Intelligent mental force and boldness in exploring unseen regions in the body has enabled surgery to perform many cures where exact conditions were wholly unknown before the remedy was applied. Do practitioners of rational medicine know less of physiology and pathology in the domain of the mental than the long-haired quack? Surely courage, dignity and the indelible impressiveness of a strong personality are nowhere more pronounced than in our profession. Why then is mental therapeutics shunned by a large proportion of our profession? Many reasons may be assigned, but two are especially obvious: (1) The period of intelligent practice of medicine is but an infant compared to the many years that witchcraft and superstition dominated the healing art. The progressive thinkers were a helpless minority until recent years. Gradually intelligent thought directing physical and chemical remedies in action on material structures produced effects which appealed to perception as beneficial to the individual. (2) Exploration in the materialistic realm presenting as it does so many tangible facts, has detracted from inquiry into the intangible domain of mind. We are, however, daily observing facts which show conclusively that the mind is a dynamic reality. Neglect of the mental did not lessen its activities, which for want of intelligent direction became the field of operation for the masses of illiterate who could perceive effects, without reasoning to their cause. It is only in recent years that psychology has been intelligently studied in its application to unnatural bodily states. Gradually we are learning to direct these mental forces to helpful influences on the body. The effects produced have been received with incredulity, yes, even ridiculed more rigorously than Jenner's vaccination, which our homeopathic friends use without perceiving its *modus operandi*.

The believers in rational, mental therapeutics

* Read before the Nebraska State Medical Society at Lincoln, Neb., May 28, 29, 30, 1903.

are increasing so rapidly that only the minority are pessimists concerning its utility in practising the healing art. Not many years since when brain surgery was proposed the majority passed adverse judgment on present possibilities. It is not because our profession is wanting in men capable of utilizing mental therapeutics, but because our schools have failed to properly instruct students concerning physiology and pathology in the psychic realm. The physician who now enters practice in any department of medicine without a working knowledge of psychology is heavily handicapped. Specialists who study the whole man, though directly practising but one department, are the men who see and utilize the force of mind in medicine.

If wresting the physical and chemical treatment of disease from the realm of superstition to its present plane of rational medicine has been difficult, the rescue of mental therapeutics from Mesmerism, hypnotism, Dowieism, Christian science, plus the multitude of "pathies," each of which is but an excrescence on rational medicine, is harder. It is more difficult because it presents something active that cannot be weighed nor measured. According to Ladd the assumption that the mind is a real being, which can be acted upon by the brain, and which can act on the body through the brain, is the only one compatible with all the facts of experience. This makes the body and mind each governed by laws in its own realm, yet inseparable and interacting during life. Cases illustrating this truth are so familiar to all I cite only one:

Miss A., aged thirty-eight years, was admitted to the Methodist Hospital, Omaha, November, 1901, where I called to see her. For twenty years her mode of locomotion had been either in a wheel-chair or carriage. From birth to her eighteenth year her health had been excellent. In her eighteenth year she had an attack of fever, the true character of which we were unable to learn. She said her physician called it malaria. This fever lasted three or four weeks. When convalescent she attempted to walk, only to discover her lower extremities too weak to support her weight. No history of any sensory disorder. No deformities. Present condition: Muscles of lower extremities flaccid and but slightly wasted. Reflexes and sphincters normal. Tongue coated. Intestinal fermentation, with persistent constipation. Repeated examinations convinced me she was an invalid from long introspection. Too early attempted use of her legs was succeeded by a prolonged non-use beyond the period when they would have sustained her weight with moderate exercise. If she would walk again she must relearn the process. This she did in a few days. In four weeks she walked a mile each day, and in three months had the use of her entire body. The material therapeutics I used was Sod. Phos. daily for several weeks. The mental therapeutics I employed consisted in supplying her with conditions suggesting the use of her legs, removing all evidence of physical help by others, giving posi-

tive assurance that her spine was not diseased, and that we all knew she could walk a specified distance. This mental medicine stimulated her to effort, and the task was soon accomplished. Her courage was now in the ascendancy and restraint from too arduous exercise, was necessary. Without consulting her judgment of what she could or could not do, I mapped out as on a checker board a graded scale of exercises for her daily use. I specifically indicated her diet and the hours when she should eat, sleep and exercise. She told me everybody, doctors included, said her spine was diseased, that she could not walk, and she, believing this, suited her actions to the dictations of her mind. I never interrogated a more "unwilling witness." She had been thoroughly drilled in answering questions intended to establish it as a fact, that her spine was diseased. On cross-examination her ability in evading self-contradiction was remarkable. This extreme case illustrates what we all see in lesser degree in our daily practice. Experience teaches that the laws governing the bodily functions originate in the realm of the mental. With this fact existing, we may only rise to the possibilities of our profession when we cultivate an acquaintance in the domain of mind, commensurate with our understanding of the physical body.

USES AND LIMITS OF NON-PHYSICAL THERAPY.

BY SMITH BAKER, M.D.,
OF UTICA, N. Y.

NO DISCUSSION of the uses and limits of non-physical therapy can reach tenable conclusions without first defining what is meant by the term.

When this attempt is made one becomes conscious that the data for such a definition are largely wanting. The conception, non-physical therapy, is yet a mist of vague generalizations from which it is difficult, if not impossible, to draw forth an image clear or very promising.

From what one can learn, non-physical therapy seems to include not only the use of subjective forces, whatever these may be, but also of the various media through which these supposed forces are manifested. Thus the "mental healer" not only thinks what he desires to accomplish, but seeks by certain physical means, both ordinary and extraordinary, to convey his thought to the comprehension of his client. Even where so-called "telepathy" is assumed, it is supposed that some subtle bridge or other serves to convey the molecular agitation of the influencing brain to the ready-to-be influenced brain of the recipient. At least this is what I glean, not so much from what is published as from methods really used in special instances. And so with the "prayer-curst," the "faith-healer," the "scientist," and the like. The practitioner himself not only prays either silently or audibly, or does something objectively patent, but also requires an actively responsive subsidence of all opposition and doubt on the part of his subject, just as there must be more or less

acquiescence when hypnotism is exercised. In either case there is more or less use of physical means through voice, vision, touch and the like; which means are quite as obviously necessary as is the subjective power behind them. Even Dr. Riviere, in his very recent paper before the International Medical Congress, makes his conception of psychotherapy to include the uses of heat, light, and electricity; while a recent caller has astonished me by affirming that the newly discovered gaseous elements, argon and helium, are the medium through which all such influences are transmitted. We see, therefore, that in a definition of non-physical therapy which shall strictly conform to facts only, we must admit at least a modicum of physical elements, in addition to whatever non-physical ones we may choose to include.

But this is not what the authoritative votaries of non-physical therapy claim. They usually affirm that the influence is purely immaterial; is, in fact, an influence of "pure mind," or "pure soul," upon some other one. Sometimes this is said to be embodied, but in some supraphysical way, as, for instance, in the cures of so-called "spiritualists"; yet, in the end, "pure mind" or "pure being" is held to be the real fountain and stream of all the non-physical therapy, which, to them, is worth considering.

This attempt to define non-physical therapy brings us at once to an important conclusion, namely, that, before its uses can be determined, there must be more accurate investigation of all these matters, and more credible records of both subject-matter and results, than are now to be found, and this, in spite of the labors of those who have already attempted to place them in a truly scientific order. Probably there is nothing in all the broad realm of functional neuro-psychoses that is so universally evident at the present time, as the part played, either for good or ill, by non-physical therapy. Almost every case, at some time or other, goes through some phase of it, and quite as often as otherwise to no good whatever. On the other hand, there really are instances of neurasthenia, and hysteria, and chronic invalidism, aboulia and dependence, which are markedly helped, and this more or less permanently, and too, after various futile exhibitions of material appliances and remedies. That there is something which our gross and even our fine pathologies, and all our medicinal and medical remedies do not yet explain and reach, is gradually being defined, by many, yet crude, practitioners in these various fields. What that something is, and how to find out about it and legitimately to make use of it, remains yet to be seen.

This will not, cannot be, however, until several difficulties are themselves better defined:

1. There must be a clearer notion of the difference between initiative and cure. To start a person on the road to recovery may by no means assure his traveling it successfully to the end. Yet this is just what the non-physical curist assumes more frequently than otherwise. Thus the

wife of a physician of my acquaintance could not sleep. No kind of legitimate medication seemed to have the desired effect. The doctor heard of an institution where such things were cured by so-called "therapeutic suggestion," and sent his wife there. She was promptly assured that she could be cured, and very soon she was cured, that is, apparently. Encouraged by this, the doctor himself went to the institution for instruction in the art, which he seems to have pursued thoroughly. Since which time, however, he is obliged to treat his wife rather regularly in order to keep up the sleep habit, first suggestively induced. As an initiative, the suggestive treatment was a success. As a cure, not so, any more than the ordinary hypnotics would have been. Cure, in any given case, may stand for very different results; as, for instance, simply to restore to the former degree of health; or, only to a partial degree of health; or, only to an abiding hope that eventually health will be attained; or, to the stage of a mere temporary relief. In either case, both the popular and the professional idea of cure seems to be but vaguely differentiated; yet this constitutes a real limit to the uses of non-physical therapy, which seems to be rather deeply fixed. Cure, in any comprehensive sense, should include both the beginning and the end of the disease cared for.

2. Another difficulty, a profound and far-reaching one, which must be taken critically in hand before the uses of non-physical therapy can be determined, is the professional apathy, fear, and taboo with which the whole subject is so commonly regarded. We naturally shrink from the uncanny, to say nothing of the ignorant conceit and assertive presumption which so generally deal with it. "There is nothing in it," easily satisfies, and allows us to think that if we stick to physical methods closely enough, we have done our whole duty. There is also the allied fear that we shall simply make ourselves ridiculous, and, in the end, accomplish little or nothing worthy of our pains. Altogether, it is truly enough a subject for taboo, either tacit or actual; but, as such, is involved in a difficulty which must be overcome before headway in investigation can be made or definite indications or uses be determined.

3. Other difficulties are the essential ones which possibly may never be overcome. Especially is the impossibility of analyzing such concepts as "mind," "spirit," "faith" and the like forbiddingly important; so much so that one hesitates to attempt anything bordering upon the subject. Yet we have only to think that it is precisely the same case with heat, light, electricity, chemism and the like to see how interferingly fallacious such a feeling is. Here no one thinks of trying to resolve the concept into simpler terms. Heat is heat, light, light, and so on. And so on, too, mind is mind and nothing more in the last analysis is possible. Yet, as in the case of so-called physical agents there has been no end and there seems to be no end possible to the extent to which investigation and knowledge of their manifestations may be carried, so let us hold that

even though we cannot define mind, soul, etc., we can proceed to study their manifestations with a thoroughness which has never yet been given, and with at least some prospect of encouraging success. So long, however, as we wilt and refrain under the spell of philosophical nescience we will most certainly make no headway.

4. This leads to the important question, Is there actual need of special training for this kind of investigation? Much can be said, undoubtedly, concerning the worth of the work of all who have heretofore carefully worked along these and similar lines; but one cannot refrain from believing that their results would eventually have been much more convincing, had the investigators and reporters, to a greater number, been practising neurologists and psychiatrists, especially such as may have been rightly facultied, and qualified in special ways for such an undertaking. The trouble, thus far, has been that in too many instances the materialist has seen only material sequences in the human world; while the immaterialist or, technically, the idealist has seen similarly that everything is derived from and hinges upon immaterial foundations only. What is needed, is an all-round observer with keen eyes for mind matters and for body matters and for related affairs, all in one vision. At any rate it is increasingly evident that until the matter of non-physical therapy is taken in hand by those especially qualified to be capable of this vision, it will be practically impossible definitely to determine what the field and limits of non-physical therapy may really be.

But given accurate data and definite conclusions, it remains to ask, Is non-physical therapy properly a remedial desideratum? To which the answer may be given variously, according to predilection and experience.

Nothing that mankind becomes vitally interested in should be regarded as too trivial for investigation or use. The fact is, many of the so-called diseases themselves are, from certain points of view, rather more frivolous than otherwise, yet no one would deny their being legitimately the subjects of labored observation and much reflection. If this matter of non-physical therapy seems trifling or frivolous, we must remember that both to the sufferer and his healer it often seems to be of an importance much too serious for ridicule or neglect. The rather, both the practitioner and his subject have equal need that there shall be skilled elucidation of that which at present is so speculative, if not fraudulent. Either there is something in these matters worth while or there is not. Practically we cannot escape certain problems which definite instances present in every clinic. Thus, a cultured woman, aged thirty-five years, married, residing in one of the larger cities, having an acquired neurasthenia of long progress and standing, had been under the care of a leading practitioner who gave her electricity, tonics, baths, rest, massage, etc., assiduously, but yet without much benefit. She now declares that, in some way or other, she ab-

solutely must have relief from her alternating mental and nervous irritability and weakness and apathy. She adds that an acquaintance, who seemingly was like her, has meanwhile been under the care of some sort of faith healer and has been cured. Cannot she, too, be benefited? If not regularly, then in some such manner, and so forth.

Now, such typical problems demand solution repeatedly, both in our own practice and in those of our confrères. Tired and disgusted with the ordinary physico-remedial measures, such people logically ask, if some sort of non-physical therapy is not in order. To which, who of us is now prepared authoritatively to say. Yet, says Dr. S. Weir Mitchell: "If he does not intellectually respect the complex matters of soul, mind and body and their interdependence, he is unfit for the higher seats in the temple of the god of medicine."

It seems to me, then, that inasmuch as medicine not only discusses the body and its functions and diseases, but also the mind and its peculiar aberrations and alienations, there is no impropriety whatever in admitting the legitimacy of the field of non-physical therapy, as one for research and possibly for practice. As a matter of fact, the study of non-physical phenomena, whether remedial or otherwise, is but a study of reflexes, and as truly this as is that of the knee-jerk, or the ankle-clonus, or the Argyle-Robertson sign. Only they are reflexes of a so-called higher and certainly much more complex and diffusive order, than these latter are. Possibly, it were worth while just now to put these on a par exactly with the simpler sensorimotor phenomena, and always to require their elucidation whenever the nature of the case demands. Practically, every case of disease has its more or less pronounced associated psychosis which often varies both the natural history of the physical ailment and the effect of the remedies prescribed. Moreover, it is a common belief that suggestion plays an important part in determining the ultimate uses of ordinary remedies. It would not be a very unwise step at least to attempt as never before to place all this on a par with other branches of medical science and practice.

Nor need we hesitate to do this because *a priori*, and even most probably *a posteriori* a generous use of the imagination will have to be made in the prosecution of the enquiry, as well as in the statement of final conclusions. The fact is, there has been and there must be all along, this very imaginary or subjective element in all our histology and pathology, even as there is in all the basal conceptions of the purest physics everywhere. When we think of it, such fundamental notions as the "nebular hypothesis," "evolution," "atomic theory," "neuro-psychical parallelism" and the like are simply figments of imagination, the pictures which the mind discloses as it attempts to comprehend the constitution and function of the universe. But this is considered to be perfectly legitimate; and especially so, since

the masterly essay of John Tyndall on "The Scientific Uses of the Imagination" was published. And so in all our conceptions of histology and pathology, materialize them as we will, there is yet included representative as well as presentative elements, and this to no impairment of their worth whatever; for we all know that they each and all stand, at best, as working hypotheses, to be modified, as future discoveries and thinking shall determine. So must it be in any and every attempt to study and relate the field of neuropsychical therapy. Imagination will have to be used, and this generously. The only question is, Who shall be considered able to do it so that credence can be given to its conclusions?

In conclusion, then, we must note, that the irregular practitioner, either honest or dishonest, is gradually defining a field of non-physical therapy which sadly needs investigating with all the skill of the highest grade of endowment and training; also, that this cannot be done, except those who have the requisite preparation devote themselves to it persistently until the facts are ascertained. The ideal investigator in this field would seem to be one who, with a most thorough academic and professional education to begin with, shall then take post-graduate courses, not only in every practical field, but having likewise disclosed an aptitude and liking for psychological and psychiatric research, shall take special courses in these fields also. To such a one the way to satisfactory achievement is wide open, and certainly not crowded.

THE SIGNIFICANCE OF ALBUMIN AND CASTS IN SURGICAL PATIENTS.*

BY JOHN C. MUNRO, M.D.,
OF BOSTON, MASS.;

SURGEON-IN-CHIEF CARNEY HOSPITAL, FORMERLY ASSISTANT VISITING SURGEON, BOSTON CITY HOSPITAL; INSTRUCTOR IN SURGERY, HARVARD MEDICAL SCHOOL.

THE statement of a surgeon of considerable experience that he would not operate in the presence of albumin and casts, except in cases of great necessity, excited the writer's curiosity to investigate the prevalence of these indications of renal disturbance in recent surgical patients at the Boston City Hospital.

The report must be considered as barely more than preliminary in character. To carry out such an investigation to its full completion would mean years of observation of individual patients in large numbers, a task almost impossible when dealing with charity patients. If the statements of life insurance examiners be true that temporary albumin in the urine does increase the risk, even though to a slight degree, it must in the same way influence the later histories of our surgical patients. That it influences the immediate history, however, of patients suffering from surgical diseases is extremely doubtful.

Without doubt there is danger in operating

upon a patient whose kidneys are incapable of sufficient elimination and where there are secondary organic changes. But because a patient exhibits a small amount of albumin, hyaline and fine granular casts, with renal cells, the conclusion should not be hastily made that he is not a fit subject for operation. Definite contra-indications in the way of deficient elimination, vascular degeneration or other organic changes must be present.

On the other hand, to avoid the mistake of being too casual, the presence of any renal danger signals should make one take heed lest he overlook concealed or unsuspected serious lesions.

Five hundred cases showing albumin and casts in the urine admitted within the last two or three years into the surgical wards have been roughly analyzed. Altogether 4,185 cases were considered. Of these, none that showed obvious renal degeneration or glycosuria has been included; nor have patients suffering from genito-urinary disease, burns, erysipelas or similar diseases been included. We found, first of all, that approximately a good 35 per cent. of all patients treated in the surgical wards showed signs of renal trouble. This is probably a fairly accurate proportion of surgical patients in whom we must expect to find albumin, casts, etc. Indeed, we believe this percentage is below rather than above what we should look for, because it is not rare to find a record made by the house officer of "negative urine" where an attached urine chart shows that albumin and casts have been found. In other words, the significance of small traces of albumin with or without casts may be of so little value in the average patient that the house officer dismisses the findings as of no importance, especially where the progress of the case has been uneventful.

Practically every form of injury and disease is included in the present 500 cases, the majority being of serious nature. At least 60 per cent. underwent operation. About 12 per cent. suffered from fracture. In this connection it is of interest to note that these patients, with few exceptions, were etherized, many for operations of length, yet there is nothing to indicate that any renal damage was inflicted by the anesthetic.

The urine examined was that which was passed soon after entrance to the ward. The accuracy of the examination varies more or less with the ever-changing house officer. Undoubtedly rare casts and cells were frequently overlooked in the pressure of work. The quantity of albumin varied from the slightest possible trace to one-eighth per cent. In 16 cases one-fourth per cent. was recorded; in some of these the quantity diminished later to a trace or disappeared entirely. In others, amyloid disease was probably present. Occasionally no albumin was found, although casts were recorded.

In about half of the 500 cases casts are definitely recorded, probably less than the actual proportion. Blood and pus occurred very often, especially in the urine of women. Fatty casts and blood casts were not infrequently noted, but apparently they bore no special significance. The

* Read at Meeting of American Surgical Association, Washington, May, 1903.

twenty-four hour quantity of urine was not included in the reports of any of these cases. Patients as a rule that required special attention in this regard were eliminated from the present inquiry, as there were suspicious or marked renal or genito-urinary lesions.

In brief, we were curious to determine how much apprehension we should feel when about to operate upon patients without obvious renal degeneration, passing plenty of urine of good specific gravity, in which a trace of albumin with casts is unexpectedly found.

To take up in detail certain points we found that about 10 per cent. of the cases occurred in children under fifteen years of age. This was a much larger proportion than was expected, and as only eight per cent. of all patients treated at the hospital are children under thirteen years of age it makes the proportion astonishingly large. Furthermore, we find that 44 per cent. of the cases were between the ages of sixteen and thirty-five years; the time of life when albumin, at least in non-surgical patients, is supposed to be comparatively rare. Between thirty-five and sixty years of age we find 36 per cent. of the patients and about 10 per cent. were over sixty. What the relative proportion of the various decades bears to the ages of the 4,185 patients was not determined, but in whatever way it is considered, the relative and actual number of children is higher than anticipated.

The cause of the albumin and casts is difficult to determine. Nearly a quarter of the patients over fifteen years of age entered the hospital for some form of traumatism, and presumably the renal trouble was present at the time of injury. It is fair to infer that the children were active and well at the time of the injury that brought them to the hospital. Possibly alcohol is a factor in the renal irritation, because it would seem to be almost the exception for an adult patient, male or female, not to use alcohol to some extent. Many are steady drinkers; some drink to excess. Whether this alone or the combination of alcohol, insufficient or improper food and hard work is enough to cause the requisite irritation it is difficult to say. It is certainly suggestive. Sepsis, unhygienic surroundings and improper clothing are probably factors in causing albuminuria in children. In a few cases, too few to be more than suggestive, the albumin and casts that were present in the first specimens of urine passed disappeared in subsequent specimens; sometimes after operation, sometimes in cases not operated upon. A number were found in septic cases (appendicitis, etc.), where the renal disturbance seemed due to the sepsis, subsiding as soon as drainage was established by operation. The effect of simple food, rest and warmth must be considered as well. It is quite possible in non-septic cases anxiously awaiting operation, that a temporary albuminuria may be caused by the mental disturbance in a way similar to that in which cardiac murmurs are not infrequently caused.

Of the 500 cases tabulated, 63 died. These will

be considered later. In the remaining 437 patients, the natural query is whether convalescence was influenced in any way by the presence of albumin and casts. So far as could be told from a general review, without carefully analyzing each case in detail, convalescence seemed to be such as one would expect under the general circumstances; in other words, normal recoveries were as satisfactory as could be desired. Where there were complications or set backs, there was adequate explanation on grounds independent of any renal lesions.

In the 63 fatal cases, casts were absent or not seen in 30 per cent. Eight patients died from shock. Of these, one patient, seventy-two years of age, with advanced carcinoma of the breast, died almost immediately after a long operation. It is barely possible that a slight renal lesion had some influence on the result. Two died after operation for general peritonitis, one each from multiple injuries, operation for appendicitis with profound sepsis, typhoid perforation, hemorrhage following common duct operation, and septic pelvic abscesses; all potent causes of death without the slight effect from kidneys doubtfully damaged. There were 5 deaths from pneumonia, 3 from tuberculosis, 19 from general sepsis or severe peritonitis, where there could be no doubt as to the infection alone being a legitimate cause of death. In addition there were deaths from embolism, malignant disease, cardiac disease, skull fractures and pancreatitis, where the rôle of the urinary organs must have been insignificant. Of four cases in which death was ascribed to senility, one with cellulitis of the arm had one-quarter per cent. of albumin and casts, one with intestinal cancer had profuse diarrhea, one had a strangulated hernia, and the fourth died one month after a fracture of the femur, showing only the slightest possible trace of albumin, with hyaline and granular casts.

To glance at the record of the examination of the kidneys in 12 cases that came to autopsy, not included in the group just discussed, we find that one case of portal pyelephlebitis showed fatty degeneration of the kidney, another similar case had normal kidneys, as did a patient dying of gastric carcinoma, sarcomatosis, rupture of the liver and compound fracture of the leg. Fatty degeneration was found in cases of general peritonitis and sepsis, and in a fractured pelvis with pulmonary embolism. A left pyonephrosis was found in a case of abscess of the liver. A chronic passive congestion in a case of osteomyelitis with pericarditis, and an amyloid kidney was found in a case of general peritonitis. With a possible exception of the patient dying after breast amputation and the old man dying with cellulitis of the arm it requires a long stretch of the imagination to give any weight to the urinary conditions in the fatal result of these 63 cases.

In conclusion we should expect evidence of renal irritation in over a third of the surgical patients found in a municipal hospital. The mere presence of a trace of albumin, with or without

hyaline and granular casts, unattended by other evidence of renal damage, should not influence the prognosis in surgical disease or operation. The presence, however, of albumin and casts should place us on the watch for other and more significant signs of organic degeneration which may prove serious obstacles to operation or satisfactory convalescence. Furthermore, albumin and casts alone are apparently no contra-indication to the administration of ether. The age at which we must expect albumin and casts in surgical patients is under thirty-five years in over half the cases. The proportion in young and otherwise healthy children is probably as great as in adults.

LATER IMPRESSIONS OF THE "NON-HEREDITY OF ACQUIRED CHARACTERS."

BY LEWIS S. BLACKWELL, M.D.,
OF PERTH AMBOY, N. J.

In his review of an article on "Impressions of the Non-Hereditary of Acquired Characters," that appeared in the *MEDICAL NEWS* of December 20, 1902, the author, Mr. Lawrence Irwell, a member of the Bar of Buffalo in a recent communication, apparently sweeps the field like a great cyclone by his legal acumen and scholarly attainment.

The valor of the medical profession seemingly demands a restitution of the proud structures that have been erected along the corridors of the centuries.

Having recovered from the shock, a disciple of Æsculapius essays the task of clearing away the débris occasioned by this forensic fulminator. His sophistry and the character of the arguments he advances furnish a suitable site on which to rebuild.

With the audacity with which Mr. Irwell attacks the medical authorities the writer cites in support of his position, one naturally would have supposed he would have introduced to the profession of medicine educators more renowned in therapeutic literature and less vacillating than the claimants of the doctrine of evolution. With the confidence he reposes in his coterie of evolutionists, his opposition to the statement of Darwin presented in my first article, that "alcoholism is transmitted through three generations, and the families of drunkards die out at the fourth generation, after having gradually sunk in the scale of degeneration, both physical and intellectual," is not apparent in view of his faith in the preeminence of reason over authority. My opponent claims that "no man can truthfully say that Charles Darwin has anywhere written that acquired alcoholism is hereditary." That was not the quotation from Darwin, but that alcoholism was transmissible through three generations unlimited by the contingency of an acquired habit. By perverting the statement of this evolutionist, supported by revelation in the declaration of the Almighty himself, "visiting the sins of the parents upon the children unto the third and fourth gen-

eration," and in my former article was claimed to be an expression of hereditary law, Mr. Irwell reminds me of the fabled animal of ancient lore, that donned the skin of a lion.

The assertion made by the reviewer "that the introduction of the Almighty and Abraham does not seem to me to aid scientific investigation," conveys the impression of their inferiority in comparison with his trusted friends—the Evolutionists. Yet when Romanes came down toward the end of life, like the Prodigal, he returned to his Father's house, and embodied in his writings the preeminence of God above every name. He evidently fails to see the harmony of science with revelation, and "is given up to his idols," reminding one of the reply made to another boy, who had said: "His father was a member of church," replied: "My father was, too, but he wasn't doing much in that line."

I am heartily in sympathy and appreciation with my rival in "refusing to follow my lead in the realms of theology." In the expression of this sentiment, he conveys as much wisdom as is anywhere embodied in his review. I am not a leader, and possess no capacity for leadership in theology, law or medicine. I am simply a humble disciple of Æsculapius, sitting at the feet of the great teachers, who have adorned the profession, seeking to gather at least some instruction by which I might aid my coadjutors in lessening the ills of human existence.

In my previous article I presented the following extract from the quotation taken by Mr. Irwell from Dr. Adami's paper: "That alone is inherited which is the property of the individual at the moment he becomes an individual, which is a property of the germ plasma, from which he originates." In my comments on this statement, I said: "This is certainly a truism, and accepted as a fact, it seems perfectly plausible to assume that any element by which it was infected would be transmitted to the fetus, and in the case of syphilis on the part of either or both parents would manifest its presence as it had been revealed in the autopsy of a seven months' fetus." This syphilitic element certainly becomes a property of the germ plasma, which Dr. Adami justly claims as the property of the individual.

In the colossal Encyclopedic Medical Dictionary of Dr. Frank P. Foster, editor of the *New York Medical Journal*, hereditary syphilis is defined as "a syphilis transmitted at the time of conception, either through infected semen of the father or an infected ovum of the mother, or through both." This lucid signification of this form of the loathsome malady does not convey the idea of being an acquired disease, except through heredity, and conflicts with the statement of Dr. Adami that "there is no such thing as hereditary syphilis."

Mr. Irwell apparently gathers an immense amount of comfort from this sentence in Dr. Adami's article: "Any disturbance due to influence affecting the individual from without while in utero is acquired." That is a self-evident

proposition, since no individual exists until after the union of the two elements involved. The doctor would undoubtedly classify maternal impressions as an illustration of this disturbing influence.

A diathesis may be developed by habits of life, unhygienic conditions or environment, yet it also represents a congenital condition originating as the result of inheritance.

While the claim of Mr. Irwell, that the convictions entertained and expressed by some writers may be due to a failure in differentiating between the results of heredity and a habit acquired by association or imitation, may be true, yet it is a question whether this propensity toward the establishment of the drink habit may not be largely the outcome of inheritance. The assumption made by my opponent in seeking to lessen the importance of heredity by reference to the fact that "lectures devoted exclusively to heredity are not usually given in American medical colleges," and "that treatises on heredity for physicians are not numerous" is a truism, yet it does not detract from the importance and value of the subject. This assertion also applies to the topic of etiology of which heredity forms only a part.

The statement made in Dr. Adami's paper, "To judge from the medical press, we medical men care for none of these things," is confronted by Davis (*Chicago Journal of Nervous and Mental Diseases*) Magnus Huss, Thompson de Kapein (*Arch. de psychiatrie*), Faguet (*Heredity in Alcoholism*), Louis (*Essay on Hereditary Diseases*), and many other authorities. These representative men of science with those already cited in my previous article are certainly sufficient to indicate the claim that physicians are not only willing but have made the study of heredity a subject of great interest and profound investigation.

In the concluding paragraph of his article Mr. Irwell says: "I have never asserted that acquired characters cannot be transmitted." This would be superfluous, as the idea by transposition is embodied in his subject—acquired characters are not hereditary.

"Although I attach little importance to authority as compared with reason," writes Mr. Irwell, who in utilizing a vast amount of this material in his discussion, evidently "shows his faith by his works," "I feel justified in resorting to a little evidence of this kind." He says: "The leading neo-Lamarckians claim that the blind fish found in caves are progeny of fish that became blind by accident."

As exercise promotes development in the physical, intellectual and spiritual sphere of man, the converse must necessarily be true. These are facts in science, which I shall constitute the basis and the premise of my syllogistic reasoning. "The blood is the life" is an infallible proposition, alike in nature and revelation. Without it there is no functional activity in any organ of the body. It is essential to the performance of the digestive process, and absolutely necessary in the accomplishment of intellectual labor. The power

of thought initiated in the cerebral cortex is materially enhanced by culture, illustrated by the greater ease by which the student accomplishes his task a few days after his admission into the school room. If he devotes his attention solely to some physical pursuit, there is declension in the character and strength of his intellect. The same remark applies to the muscles, when confined by fracture appliances, revealed in their softened and debilitated condition, that unfit them for usefulness, and if continued for a long period would eventuate in their complete disqualification.

After a woman has passed the climacteric, less blood enters the organ, less nutriment is supplied, and the uterus becomes atrophied. Accepting this statement of facts, it is reasonable to conclude that fish inhabiting dark caves are blind from the absence of the stimulus of light, rather than from the result of accident.

While I entertain a high regard for scientific men of thought, and enjoy the literature of profound research, represented by these brilliant evolutionists, yet I prefer to accept the results of medical investigators whose brows are crowned with laurels in the temple of fame.

THERAPEUTICS OF POTASSIUM COPAIBATE.*

BY LOUIS KOLIPINSKI, M.D.,
OF WASHINGTON, D. C.

FOR nearly two centuries copaiba has been the standard internal remedy for the treatment of specific urethritis. Recommended by almost all writers, its popularity has never diminished. It has made fortunes for charlatans. Its use has spread into the hands of the laity.†

The first to recommend copaiba in venereal disease in such a manner as to make its use part of a system of treatment was Daniel Turner, M.R.C.P.‡ He writes: "In my own Practice after I have sufficiently Purged of the Virulency, or as the Quantity and Color of the Flux shall indicate; I usually finish with ʒi of the Balsam Copaiba called commonly Capivi, given at several times; *vel sub forma Electuarii cum Conserv. fruct. Cynosbat. vel instar Pastae albae, cum sacch. alb. praep. sumendo Alterutruis Quant. Nuc. Mosc. Maj. mane atque vesperi, ventriculo vacuo.*

"One Pot of this Composition hath very frequently completed the work; or if there be occasion, I repeat it once, twice, or perhaps thrice, if any Remains of the Gleet should so require, and this Remedy I prefer to any of the Terebinthinate Ones, or indeed any other of the natural Balsams whether *Gileadense, Peruianum Opobalsamum,*

*Read at the meeting of the American Therapeutic Society, held at Washington, D. C., May 12, 1903.

†On the authority of the U. S. Treasury Department, Bureau of Statistics, there were imported into this country in 1899, 210,223 pounds of copaiba; in 1900, 202,092 pounds; in 1901, 212,082 pounds; in 1902, 235,194 pounds.

‡For the fiscal year 1902, 213,645 pounds came into the port of New York from the following countries: Brazil, 89,936, England, 60,438, Venezuela, 47,531, Colombia, 12,623, Germany, 2,390, Salvador, 253, Costa Rica, 96, Nicaragua, 378.

§Syphilis, a Practical Dissertation on the Venereal Diseases, etc., London, 1717.

Tolutanum (all used by some Practitioners for this purpose) because I find it heals and binds less than the last; Nor is it such a Tell-tale as the former, where the Chamber Pot by its smell, discovers what has been done all over the House; besides it is less Nauseous to many People's Stomach than the Common Turpentine, especially if taken in the Way I have here prescribed it. Indeed I have often wondered so few of our Writers have taken Notice of this noble Medicament, in finishing the Cure of *Claps* and of *Gleets* arising from thence; for which I believe very few Remedies can compare in the whole Physical Republick, and they who know rightly how to time it, may perform more in a Week than by all the other Methods now used, in a Month. I am sure I have known one Single Ounce thereof effect more in some of these Cases than a whole Pound of Turpentine, mixed up too as Mr. Wiseman directs cum *Pulv Jalap, Crem. Tart. et Sale Prunel.* or than the *Chios* and *Cyprus* Turpentine taken alone in large Quantities."

Turner thus used copaiba only in the stage of decline of gonorrhea—an error copied from book to book since his time.

Of the few who have condemned copaiba may be mentioned J. L. Milton.* He writes with much repugnance but little reason. He warmly commends Thorn's preparation, to be next described, without apparently having had any practical experience with it. His praise, however, is both just and merited.

Three theories have been produced, claiming to determine the active principle of the drug, or the parts to which its virtues are due, of which the first is that of James Thorn,† M.R.C.S. The following extracts give the substance of this interesting essay: (pp. 7-8.) "The medicine which I have seen used with the best success (in gonorrhea) has been the balsam of copaiba given after the inflammatory symptoms have subsided: but the dislike generally expressed by patients on taking it,—the circumstance of its not being available in the inflammatory stage, detract from the value of this remedy. From these circumstances I was induced to try what would be the result of an analysis of the balsam, conceiving that its active principle might be very much concentrated and rendered more extensively useful when separated, than in the present form. By distillation, an essential oil was produced of a light green color having a most unpleasant smell and taste; its specific gravity being 0.876 to 1.000 water, leaving a brown resinous extract, quite soft, but becoming hard and brittle when cold; nearly tasteless and inodorous, soluble in ether and pure alcohol. The proportions obtained from two ounces of the balsam of copaiba were: eleven parts essential oil to five of extract, the respective merits of which I shall hereafter mention; and

from the result I feel convinced that by separating the essential oil from the resinous extract, a very irritating and obnoxious part of the balsam is got rid of; and moreover, in the extractive resin all the virtues of the copaiba beside. . . . In the first stage (first twenty-four hours) may be given extract of copaiba with the most decided advantage in very large doses, from 15 grains to a scruple three times a day. . . . In the stage of gonorrhea in which the inflammatory symptoms are fully developed, which is generally within two or three days from the first appearance of the symptoms. . . . Unless the inflammatory symptoms are very excessive, and there appears any disposition from the previous history of the complaint to swelling of the testicle. I have given the extract of copaiba from 10 to 15 grains three times a day when first applied to, while the patient is affected with all the inflammatory symptoms." (p. 21.) " . . . It must be obvious that I do not recommend the extract of copaiba to be given while there is inflammation of the testicle or epididymis. On the contrary, it is better to resort to those means which will promote the discharge from the urethra, together with abstraction of blood from the scrotum, and such depletory measures as the circumstances of the case may require." (p. 23.) "The success of the application of the extract of copaiba in the inflammatory stage of gonorrhea may be doubted by many, from the circumstance of the balsam having been found not only of no use, but very prejudicial while inflammation of the urethra existed. But the sceptic on this point has only to take into consideration the difference between the preparations: that in the one there is an essential oil extremely irritating, and possessing qualities as hurtful as I can well conceive anything to be, for gonorrhea; while in the other there is only the pure resinous extract freed from the essential oil." (p. 45.) "There are some advantages, however, as a therapeutic agent, the extract possesses over the balsam, which it may not be amiss to mention more fully than has been done in any former part of this work. The first, which is that of its not producing the nausea, any disturbance of the alimentary canal, or the eruptions on the skin, which the balsam does." (p. 50.) "My opinion is that the frequent cause of the failure of balsam of copaiba, in curing gonorrhea, may be attributed to it (the variation in the quantity of extractive resin found) and that the good effects have been in proportion to the quantity of extractive resin the balsam contains."

Thorn thus was the first to use the acid resin—copaibic acid under the name of extract of copaiba. In a later work he commends it to be given combined with an alkali, hence practically a soluble copaibate. Thorn was correct in recognizing the curative power of copaibic acid in the disease when used from the beginning, also that the mass is more agreeable to take than is copaiba. In error, however, when he thought the

*On the Treatment of Gonorrhea without Specifics, London, 1862.

†Observations on the Treatment of Gonorrhea by a New Preparation from the Balsam of Copaiba, with Illustrative Cases. London, 1827, p. 57.

volatile oil acrid and irritating or that the acid resin will not disturb the alimentary canal or cause skin eruptions.

The second theory is that of the volatile oil. H. M. J. Desruelles* relates that in 1826, M. Dublanc, a distinguished chemist, thought the resin of copaiba is inert and conceived the idea to distil balsam of copaiba and to extract a volatile oil. This oil, to which a few drops of sulphuric acid is added, assumes a red or reddish-brown color and loses some of its bad odor and taste. The volatile oil with and without the addition of the acid was tried by Desruelles with success. In value he held 4 grams of the volatile oil to equal 16 of copaiba. M. Cullerier at l'hôpital du Midi had similar good results.

The third and last theory is that of Bernatzik,† of Rocco da Luca and Amato, 1884, quoted by E. Finger.‡ They studied the action of copaibic acid and of copaiba oil on gonorrhea and came to the conclusion that neither of these two constituents when isolated has the action of the natural combination.

Bernatzik, in his much quoted article, says, when we recollect that the oil of copaiba stands in high physiological relationship to the resins; that therapeutically almost as active as they, though at the same time it is milder and hence mitigates the action of the resins on the intestinal and urinary tracts without detriment to the curative properties, one is justified in preferring the balsam in therapy to either of its constituents. The ethereal oil is the natural and most appropriate therapeutic co-agent and excipient and adjuvant to the resins. They, according to these recorded observations, act much too violently even in moderate doses, and in many cases, to increase the same or to continue their use is simply impossible. The greatest effect is to be found in using the thin variety of the balsam as being milder in action, due to more of the oil and less of the resin.

This study occupies itself entirely with the effects of the acid resin in alkaline combination. From both a lack of knowledge and experience the writer does not venture an opinion on the medicinal merits of the essential oil. The actions and effects of copaiba are too well-known to be described or discussed.

Copaiba, popularly and incorrectly called a balsam, is an oleoresin. Its sp. gr. is from 0.950 to 1.000 (Watt's Dictionary of Chemistry, 2nd ed.). It contains a levorotatory terpene (copaiba oil) $C_{20}H_{32}$, boils at $250^{\circ}C.$ to $260^{\circ}C.$, sp. gr. 0.900. The terpene from ordinary copaiba yields a crystalline hydrochloride $C_{20}H_{32} \cdot 4 HCl$. The terpene from Maracaibo copaiba yields terephthalic acid on oxidation. It also contains (A. Wurtz—Dict. de Chimie pure et Appliquée) two acid resins, the chief being copaibic acid $C_{20}H_{32}O_2$ —it crystallizes. In composition it is the same as abietic acid. The other resin is

viscid and uncrystallizable and seems to be a product of the alteration of the former.

Copaibic acid forms with bases combinations yet little known, soluble in alcohol and ether, insoluble in water. Potassium and calcium yield non-crystalline; lead and silver, crystalline salts. The amorphous resin seems to have the same chemical composition as the crystalline resin. It possesses the special character that it can be produced by the oxidation of the essential oil in contact with water, while the crystalline resin is produced only by the action of vegetation.

Metacopaibic acid $C_{22}H_{34}O_4$ has been found in Maracaibo copaiba and oxycopaibic acid, $C_{20}H_{32}O_3$ in Para copaiba.

Copaiba holds a variable quantity of essential oil. In some samples 30 per cent. was found, in a greater number, very little or none at all. The amount of volatile, which is given at 40 per cent. to 60 per cent. is higher than any copaiba examined by the writer. Probably most of the drug kept and dispensed in the shops contains very much less.

Potassium copaibate was prepared in the following manner: eight parts by weight of copaiba are mixed with one part of potassium hydrate dissolved in a small quantity of water. On agitation or stirring, saponification results. The mixture is allowed to stand for a few days. Three layers are then found to have formed. The uppermost contains the volatile oil, if present. The middle one is potassium copaibate; the lowermost is the residue of uncombined alkali in water. Thus made it has these properties: It is a clear fluid of reddish brown color. At $50^{\circ}F.$ its consistency is gelatinous; at $63^{\circ}F.$, thick and oily; at 70 to $80^{\circ}F.$ it is quite liquid. Its taste is acrid and peppery; its odor similar to that of copaiba. The reaction is alkaline. It dissolves in alcohol, ether and chloroform. Its solution in water is opalescent; which soon becomes milky white from composition.

The alkaline copaibates have properties much alike. Potassium copaibate was adopted as the best of its kind because it is a more stable compound; is more convenient to handle; is more agreeable to take and more certain in its effects than the copaibates of sodium and of ammonium. The dose of potassium copaibate is from 50 to 150 grains a day. It is best taken in gelatin capsules No. O.O., so-called ten-grain ones. Four to twelve capsules represent the daily amount. The average man will tolerate two capsules thrice repeated. The robust with strong digestive powers, twelve. The weakly and those easily purged will not be able to take more than four for the same period of time.

The untoward effects of the copaibates are similar to those of copaiba, but not so severe, frequent or constant. A patient may give up copaiba ad nauseam, not so the copaibate. The after-taste, eructations and gastric oppression are but seldom mentioned by those taking it. Lumbar pains do not appear or are so slight as to escape comment. Overdoses produce strong laxa-

* Histoire de la Blennorrhée Uréthrale, Paris, 1854.

† Vierteljahrchr. für die Prakt. Heilkunde, 1868.

‡ Die Blennorrhoe der Sexual Organe und ihre Complicationen, 3. Ed., 1893.

tive effects without corresponding diuresis. Those of costive habit find the bowels regulated. The proper dose apportioned to the individual seems to improve the digestion; is without purgative effect and increases the urinary secretion.

It produces skin eruptions—roseola and urticaria—as does copaiba and these occur only in susceptible individuals from any dose, large or small. In a daily experience of several years, four such instances of drug exanthem were observed.

The following is the history of one showing that it remains with the judgment of the practitioner to continue the remedy or not.

Case I.—Waiter, aged twenty-three years, married. A gonorrhea, first infection, of three weeks. Treatment: Self medication with injections and copaiba emulsion. Present condition: purulent urethral discharge, pus and shreds in the urine; urination urgent and frequent. A copaiba roseola, slight on face and neck, more abundant on forearms and hands; much itching; has been out some days. He took two capsules of the copaiba at noon and the same number at 4 o'clock in the afternoon. In the evening the rash was much intensified; the patient greatly frightened. The roseola had changed to a very active urticaria. He complained greatly of the itching. The face, neck and hands were swollen. The copaiba was suspended, and the next day the second eruption had disappeared, nor did it or the first one return. He resumed the copaiba at once taking twelve grains every three hours. Treatment ceased a week later, patient being cured.

Case II.—A young man with acute gonorrhea, first infection, complicated with peri-urethral abscess posterior to the corona glandis, developed a very abundant rash within two days from taking the average doses of the copaiba. On the limbs the roseola was discrete and sparse; on the trunk, especially the whole of the anterior surface, it was very densely placed. It disappeared on omitting the copaiba and substituting sandalwood oil. In three days the patient, of his own volition, resumed the copaiba in the original dose; the exanthem did not reappear.

The copaiba of potassium is a soap. Used as such it will be found to be actively detergent, antiseptic in a moderate degree and of an odor more or less aromatic. It is useful in some cutaneous diseases. The writer has cured with it chronic eczema of the hands and of the legs. Acne vulgaris and acne rosacea are improved by applying it undiluted and removing it by washing with water as soon as burning begins to be felt. Two or three drops to a fluid ounce of water offers a solution which is an agreeable cleansing and palliative spray in catarrh of the nose and throat. In laryngeal catarrh and in the hoarseness and enfeebled voice of singers and speakers it has been much praised by patients. Applied undiluted on pledgets of gauze on ulcerating cancerous tumors it removes fetor, ar-

rests purulent and putrid discharges and prevents hemorrhage. Its internal uses are like those of copaiba; its more particular actions are these. In anuria of the non-obstructive form it has been successfully used by the writer. In acute cystitis it often effects a cure and its power is more marked in women than in men. Chronic cystitis is palliated; pain and tenesmus relieved. The urine is less loaded with pus and mucus; decomposition is less active.

In diseases of the respiratory tract, of the stomach and of the intestine, no action worthy of note has been observed. In cholelithiasis or gall-stones it has been found very useful. It compares favorably with the treatment by olive oil or the use of Carlsbad water, whether in the latter instance the patient be treated at home or is able to sojourn at this or that mineral spring. Not alone does the copaiba prevent attack of biliary colic but also when this has occurred the resultant jaundice is shortened in duration; the period of prostration is much lessened and recovery very much sooner attained. Gall-stone disease is common and the cases suitable for surgical operation are comparatively rare. Therefore the multitude that suffers from minor gastric disturbance, transient pain and occasional attacks of acute obstruction and expulsion is the proper class for which the copaiba can be commended. How the copaiba acts is obscure. It is not a solvent of a biliary stone.

The following short record narrates a case of infrequent severity:

Case III.—A young mother, with an infant of six months at the breast, had had from one to three attacks of hepatic colic every week for five months. Formerly of stout figure she had grown weak and emaciated. Some paroxysms were succeeded by jaundice, the greater number were not. The fundus of the gall-bladder on palpation was enlarged and very tender. As medical treatment had so far failed, the patient was willing and anxious for surgical relief, but was deterred from this step by the fear of ill health in her nursling. She took the copaiba steadily for three months. The attacks ceased, and at present after a lapse of eighteen months she has remained in apparent perfect health. In this one the diuretic power is recorded.

Case IV.—A young, delicate woman had a gall-stone to pass without any intense pain; the whole was over in half a day, and she did not call for medical aid. She had had a like attack two years before. The next day jaundice appeared. She was so weak as hardly able to be about. There was no desire for food. She was given 12 grains of the copaiba four times a day. The jaundice disappeared completely in forty-eight hours.

The chief use of the copaiba is found in acute gonorrhea. In the stage of gleet it is unavailing. Of the copaiba in specific urethritis it may be said: the proper dose can be steadily pushed for from one to three months without unpleasant reaction. Occasionally a copaiba erup-

tion appears on beginning its administration due to idiosyncrasy. The copaibate is a powerful diuretic increasing the secretion of urine 25 per cent. This effect cannot, however, be prolonged indefinitely in all cases. In a few instances it was observed to set up a polyuria. This polyuria disappears in a week, on the omission of the medicine. It is possible, however, that a grave form of insipid diabetes may begin and in old subjects with chronic inflammation of the bladder or other portion of the urinary tract life itself may be thereby endangered.

The course of an uncomplicated case of gonorrhea treated with the copaibate terminates often in complete cure in from one to two months.

In an early urethral infection, the copaibate if begun at once may in rare examples produce a cure in a few days.

Where a heavy purulent or sanguineopurulent discharge shows itself, and the whole organ is hot and turgid, it mitigates in a high degree the scalding pain of urination and chordee is hardly ever felt. At the end of two or three weeks the discharge begins to abate and often somewhat suddenly.

The chief merit of the copaibate is to be found however in that it reduces the danger of complications to a minimum, so that gonorrheal bubo, epididymitis, Cowperitis, prostatitis, vesiculitis, cystitis, and stricture are seldom seen to arise. Upon the prevention of gonorrheal rheumatic infection an opinion cannot be expressed for want of cases so far encountered.

Potassium copaibate possesses the virtues commonly assigned to copaiba with some special ones due to its solubility. These are its uses on the skin and mucous membranes for its alkaline, detergent and antiseptic properties; its lesser tendency to disturb the economy by producing gastric and intestinal irritation. Further, it is much more palatable than copaiba. It is true that it produces the copaiba exanthems, but this need not of necessity cause its discontinuance.

MEDICAL PROGRESS.

MEDICINE.

Influence of Adrenalin on Muscular Contraction.

—At the close of an interesting paper dealing with the effect of adrenalin and other glandular products upon muscular contractions, J. IOTYKO (Jour. Méd. de Bruxelles, July 9, 16 and 23, 1903) thus sums up the subject: (1) The richer the muscle in sarcoplasm the more energetically does adrenalin act upon it. It is a sarcoplasmic excitant. (2) Other glandular products, such as extracts of the thyroid gland, the hypophysis, testicle and ovary have a similar influence. (3) The term "physiological poisons" is proposed for the products of these glands, which, acting chemically upon muscle tissue and especially upon the sarcoplasm, have power to augment the muscle tonus. This increased tonus is most apparent when the muscle is subjected to electrical excitation; a condition most favorable to contraction having been created thereby. It may be concluded that the tonus brought about chemically in the muscles by these glandular products is a physio-

logical phenomenon which facilitates the action of the nervous stimuli and constitutes a preparatory stage to contraction. Thus these substances might be called "sensibilisatrices" their rôle being the augmentation of the sensibility (receptivity) of the muscle to the nervous stimulus.

Typhoid Paralysis.—Of the forms of paralysis depending upon typhoid infection, monoplegia is most frequently seen according to S. CERAULO and G. GRANOZZI (Gazz. Siciliana de Med. e Chir., July 2 and 9, 1902); hemiplegia and paraplegia being of rare occurrence. The appearance of paralysis seems to bear no relation to the gravity of the disease; this complication sometimes occurring in the lightest cases, while the most severe may run their course without any form of paralysis. Monoplegia is usually preceded by a sense of numbness, weakness and coldness followed by pain, which may be very severe and persist after the paralysis has subsided. The latter may last from a week to several months and is accompanied by abolition or diminution of tendon reflexes and sensibility. Hemiplegia may appear in the course of the disease, but usually appears during convalescence; and its onset is generally sudden. Paraplegia also makes its appearance, as a rule, during convalescence. In a few cases paralysis may extend to the pons and give rise to the symptoms of Duchenne's subacute general paralysis; in others, one of the cranial nerves may be involved; and in one instance, paralysis of one of the abductors of the vocal cords necessitated tracheotomy. Lastly, disturbances of speech may occur in the course of the disease or during convalescence; and children are especially prone to aphasia. As to the pathogenesis, a toxic neuritis or lesion of one of the nerve-centers is generally responsible for the monoplegias. Not so, however, with the hemiplegias, which may be ascribed to thrombosis or embolism of the sylvian artery or else to hemorrhage. Paraplegia is, for the most part, due to polyneuritis or to a medullary lesion. The transitory aphasias of children—generally of toxic origin—are to be distinguished from those of adults, which are often associated with obliterating endarteritis of the sylvian artery, embolism or thrombosis. The prognosis is good in most cases of typhoid paralysis. Intoxication being directly or indirectly responsible for such affections, elimination of the toxins should be promoted by free diuresis and other measures. Tonic treatment, massage, baths and electricity all contributed their quota toward the cure of typhoid paralysis.

Vaccinal Delirium.—The description of three cases of delirium following vaccination is given by E. RÉGIS (Jour. de Méd. de Bordeaux, July 26, 1903), as reported to him by three of his confrères. All, he believes, were of the type of toxic and infectious delirium. The initial headache and fever were followed by delirium with terrifying delusions; nocturnal only, in the lighter cases and persisting during the day in the more severe. The delirium appeared in each case during the inflammatory period following vaccination and rapidly disappeared with the suppurative stage.

The Fixation Function of the Liver.—As the result of a series of experiments, A. PI Y SUNER (Rev. de Cien. Méd. de Barcelona, No. 4, 1903) has reached the conclusion that elimination by the urine of derivatives of hemoglobin does not occur when the liver cells are in normal condition; these substances being intercepted and held—or "fixed," as the author expresses it—by the liver and converted into biliary coloring matter. Injections into healthy animals of hematorporphyrin in solution failed to induce the appearance in the urine of the spectroscopic image characteristic of that pigment; but in animals whose livers were dam-

aged by prolonged feeding with small amounts of phosphorus, such injections were followed by free elimination of hematoporphyrin.

Immunization Against the Plague.—Immunization against this disease by means of attenuated cultures of the plague bacillus has lately been made the subject of experiment by W. KOLLE and R. OTTO (*Deut. med. Woch.*, No. 28, 1903). They failed to find any benefit resulting from the use of the Haffkine method and showed that the immunity, when present, lasted only about six weeks. The authors believe that the injection of avirulent living cultures of the plague to be the only method of effectively immunizing against the disease. They secured avirulent cultures by long cultivation at 40° C. of a particularly non-virulent culture. Three loops of this culture, which is more than 3,000 times the dose of a virulent culture, could be injected into guinea-pigs without producing symptoms. Complete immunity could be conferred on laboratory animals which lasted for months by a single injection, with no signs of infection and merely a small increase in the number of plague germs at the point where the injection took place.

Auscultatory Percussion to Determine the Size of the Heart.—Some years ago it seemed as if we had acquired a valuable aid in physical diagnosis by combining percussion with auscultation either by means of the ordinary bimanual stethoscope or the phonendoscope. It was even announced that the different chambers of the heart could be marked out upon the chest-wall with considerable accuracy. Much of the enthusiasm, however, is apt to subside after one reads the article of F. MORITZ (*Münch. med. Woch.*, Aug. 4, 1903). It appears that this author has compared the figures he percussed with the X-ray shadow and has found the former to be wrong in nearly every instance. Heart-shaped tracings can be projected upon many different parts of the body for the change in sound depends upon a variation in the tension of the skin and not upon any underlying organ. The method is so unreliable that he cannot warn enough against its use.

SURGERY.

The Epidemic Nature of Appendicitis.—A very complete monograph on appendicitis by Rostovtzeff forms an important contribution to the subject. He does not recognize the epidemic nature of the disease, contrary to N. GOLOUBOFF (*Prakt. Vrach.*, No. 29, 1903), who in 1897 put forth the view, as based on clinical data, that inflammation of the vermiform appendix was an epidemic infectious disease. In this opinion he is supported by no less an authority than the famous French surgeon, Lucas-Champonnière, who considers appendicitis as a new disease of an undoubtedly epidemic character and especially prevalent in England and in the United States. Prof. Charrin, of Paris, considered the subject important enough to conduct a series of laboratory experiments, the results of which he embodied in a "Report on Experimental Epidemic Appendicitis." There is no doubt that many of the most prominent surgeons seem to be inclined to consider appendicitis as an epidemic, infectious disease, and the more the disease is being studied the stronger becomes this view. Dieulafoy goes so far as to call appendicitis *maladie toxi-infectieuse*. The author finds that in appendicitis, as in other infectious diseases, there occur icterus, acute nephritis, multiple arthritic inflammations, etc.; he even observed in two cases enlarged spleens. In contending the author draws the following: (1) Appendicitis is an infectious disease. (2) In many of the cases appendicitis appears as a primary, independent affection of the appendix, in the way that ton-

sillitis represents an inflammation of the tonsillary glands. (3) During the last eight to ten years the number of appendicitis cases has increased progressively, taking the character of an epidemic, or even endemic prevalence. (4) This prevalence is of a distinct, undoubted nature, as observed by Sonnenburg in 1899, in certain localities in Berlin and Frankfurt.

Filling Bone Cavities.—The most successful method heretofore devised for filling up cavities in bone produced by operation or otherwise, has been by means of the decalcified bone plates of Senn. Barth and Valan were able to show, however, that only a connective tissue scar resulted from the implantation of decalcified bone, while the insertion of macerated or calcined bone was followed by the formation of new osseous tissue which completely restored the defect in the skeleton. The activity of the osteogenetic process in the newly implanted area depends mainly on the inorganic bone salts present which are made use of in the formation of the new bone. Valan has also shown that all the calcium salts exert a favorable influence in this process, and the activity of the latter is directly proportionate to the similarity of the chemical relations between the implanted calcium salts and the inorganic substances in the bone. The spongy character of calcined bone also favors penetration by the osteogenetic elements. Practical application of this theory has lately been made by G. FANTINO and A. VALAN (*Archiv f. klin. Chir.*, Vol. 70, No. 3) in some 40 cases where bone cavities existed as the result of necrotomies or tuberculous processes. Complete disinfection of the cavity was obtained by thoroughly scraping out the cavity and then filling it with a 10-per-cent. emulsion of iodoform glycerin. This was brought to a boil by inserting the thermocautery point for a minute or two, and bacteriological examination proved this to be a most effective measure. In clean tuberculous cases the cavity may be filled up at once, but after necrotomies it is better to wait a few days, until it is certain that the wound is running an aseptic course. The authors employed the os spongiosum of the calf in their work, after prolonged maceration and boiling and then calcining. The cavity is entirely filled up so that no vacant spaces remain. In cases where the neighboring soft parts are healthy the wound may be entirely closed by suture, and here the process of substitution has been observed to occupy only four months or even less. In cases of acute osteomyelitis and suppurating tuberculous processes failures were often noted on account of the inability to maintain the sepsis or to completely fill all the crevices. Success was finally obtained with a mixture of the bone ash and a compound of thymol and iodoform (1:2), equal parts. This combination is fluid at 75° C. and of almost stony hardness at body temperature. After six months it was found in one case that the implanted material had largely disappeared, the new growth of bone having almost completely absorbed it. It is important that the wound and its surroundings be kept absolutely dry. In all the cases, taken together, the results were almost uniformly good and the process of replacement was complete in from three to eight months.

Cartilage Changes in Tuberculous Joint Disease.—For many it has remained an undecided question, whether the changes in the cartilages in a tuberculous joint were of a retrogressive or a progressive nature. A recent contribution to this subject has been made by SCHABLOWSKI (*Archiv f. klin. Chir.*, Vol. 70, No. 3), who had the opportunity of examining a large number of specimens, principally resected tuberculous knee-joints, and several cases of gonorrheal and syphilitic gonitis. A summary of his descriptions shows that, aside from the various retrograde changes in the carti-

lage, there are also others of a progressive nature. The cartilage, in certain cases of joint inflammation, does not assume a passive rôle and become substituted by connective tissue, similar to the process which takes place in a thrombus, but takes an active part in the formation of the connective tissue. He found that the cartilage cells in some instances became converted into fibroblasts, which increased in size toward the surface. At the same time the cartilaginous spaces also enlarged until they finally were in direct communication with the overlying granulation tissue and also became invaded by vascular processes from the latter. From this time on there is a rapid increase of cells within the spaces, until the cellular contents of the latter have become an integral part of the granulation tissue. He was unable to distinguish any marked differences in the cartilaginous changes on the articular aspect from those on the bony side. A conversion of cartilage cells into pus cells or red blood cells was never observed.

Diagnosis of Thoracic Tumors.—A practical method for the diagnosis of malignant intrathoracic tumors is suggested by A. FELD (Deut. med. Woch., 1903, No. 28). He has observed two cases in which the diagnosis was made from the finding of particles of tumor tissue in the sputum. In all suspected cases where hemorrhagic sputum is present he advises their examination against a black background for small bits of tissue, which should be isolated and again viewed after proper preparation under the microscope.

Protection Against the X-rays.—The danger to which an operator is exposed by employing his own hand or arm as a test object in gauging the quality of his tubes, has led to the production of numerous protective devices. None of these has fully met all indications. CARL BECK (Berl. klin. Woch., Aug. 10, 1903) publishes an ingenious suggestion, which consists in the substitution of a prepared skeleton of the arm for that of the operator. These bones, properly mounted, may be attached to a piece of pasteboard or other material transparent for the X-ray. The shadows of the bones, just as in the living member, are black when soft tubes are used, and light gray when the harder tubes are employed. This test object may be readily manipulated by the operator, without the latter coming within the radius of action of the rays.

Osmic Acid in Trigeminal Neuralgia.—An additional case of this complaint treated by the intra-neural injection of osmic acid after the method of Bennett, of London, is reported by J. B. MURPHY (Jour. Am. Med. Ass'n, Aug. 22, 1903). The patient, a man of seventy-six years, presented a trigeminal neuralgia of long standing, resistant to ordinary treatment and incapable of radical operation on account of the general debilitated condition. The injections in this case were given under ether anesthesia, the nerve being exposed directly over its foramen of exit and from 5 to 10 minims of a 1.5-per-cent. solution of osmic acid injected with a hypodermic needle into its substance. A small amount of the solution is also injected between the nerve and its sheath in the bony canal, but care must be taken that none of the fluid gets on the skin. Recovery was uneventful and the wounds healed by primary union. No recurrences of pain have been noted at any time since the operation. The author thinks that the acid probably acts by producing a degeneration of the nerve on the proximal side of the injection, toward the ganglion, rather than by causing a local destruction of the nerve and its terminal filaments. He thinks the former is more likely, because the pain does not subside completely immediately after the operation, as it does when the peripheral nerves are cut, and as it would if the osmic acid produced only a local de-

structive effect. Instead it subsides slowly and gradually. Moreover, the relief from pain is permanent, which is not the case after peripheral resection. A number of experiments on dogs is now being conducted by the author, which, it is hoped, may throw some light on the changes which take place after the injection.

Forensic Importance of the Roentgen Rays.—Every physician who is liable to testify in court should make a special study of Roentgen diagnosis and should be thoroughly conversant with the structure of the epiphyses of the various bones and of the appearance of abnormal bones. D. TROEGER (Friedreich's Bl. f. gericht. Med., Vol. 54, No. 4) believes that an X-ray photograph discloses better than anything else the presence of fractures and dislocations and their effect upon the bony skeleton with exception of the head and vertebral column, where the pictures frequently are not as clear as desired. Foreign bodies, if sufficiently large and of proper material, can be well located. For internal disease, the old methods frequently are more reliable, and absolutely no information can be obtained as to whether a newly born child had breathed during or after birth, or if pregnancy is present. The examiner must have experience extending over several years before his opinion can be accepted as conclusive.

Spontaneous Cure of an Intussusception.—A patient, sixty years old, is suddenly seized with severe colic and all symptoms of intestinal obstruction rapidly follow. Seventeen days later diarrhea sets in and a piece of ileum 32 centimeters long is passed. Eight days after this the patient was able to eat solid food without any disturbance. H. SCHRIDDE (Münch. med. Woch., July 28, 1903) was fortunate enough to do an autopsy since the woman died several months later from some pulmonary affection. A narrow, perfect scar was found encircling the ileum $36\frac{1}{2}$ centimeters above the ileocecal valve. Stenosis or adhesions were absent. Like in most cases of intestinal obstruction, the etiology here was not clear. Perhaps foreign bodies play a more important rôle than we think. A thin and weak mesentery is certainly a predisposing cause. Paralysis of a circumscribed portion of the intestines hardly ever occurs, yet irregular contractions of the gut are probably always present and the peristalsis is considerably increased above the site of obstruction. The invagination does not increase in size by a vis a tergo, but probably by excessive peristalsis at the head of the invaginated portion which forces this further toward the anus.

NEUROLOGY AND PSYCHIATRY.

Landry's Paralysis.—This rare and interesting condition was carefully studied by D. ROLLY (Münch. med. Woch., Aug. 4, 1903) who had occasion to observe seven cases. The disease began in all with certain prodromal signs, among which a feeling of lassitude was most complained of. In a short time, paresis of the legs became pronounced and the process then extended upward to the trunk, arms and neck. In two cases the facial nerve was involved and in two the muscles of respiration. There generally is no fever during the onset or at most only a slight rise of temperature and pain does not form a prominent sign at first. Throughout the course the reflexes are absent or much diminished and reaction of degeneration will appear eventually. Ataxia is occasionally present, muscular atrophy appears late and the functions of bladder and rectum are generally normal. No new facts could be ascertained as to etiology, like in so many cases previously published, no cause for this serious illness could be found in some while in others there was the usual history of alcoholism, syphilis and

overexertion. The author looks upon the disease as an acute, ascending neuritis and believes that if the finer nerve-endings in the muscles were to be examined with modern methods, change would always be found. The process has a tendency to creep up along the nerve-trunks into the cord but lesions are found here only if the disease runs a more chronic course. It is often hard to differentiate from acute polyneuritis but here some muscles of each extremity generally escape and the upward extension of the paralysis may be interrupted by days and even weeks of apparent quiescence. The two conditions really belong to one and the same class.

Clinical Observations in Acute Mania.—The continuous examination of the blood in four cases of adolescent mania by L. C. BRUCE (Jour. of Mental Science, July, 1903), corroborate the observations made by the same author upon the blood of patients suffering from acute continuous mania, namely, in every case there was a persistent leucocytosis, which immediately prior to an attack of mania fell somewhat, then during the attack rose, perhaps as high as 40,000 per c.mm. of blood, and during the periods of interval fluctuated between 13,000 and 27,000. During attacks the polymorphonuclear cells were relatively increased but at other times averaged 60 per cent. Having isolated from the blood of a case of acute continuous mania, a very small coccus, the author found that the blood of the cases of acute adolescent mania (a form of recurrent mania occurring in adolescents) like that of the cases of continuous mania, had the power of agglutinating the organism completely in a dilution of 1 in 20. The serum of six other cases of adolescent insanity which did not present the clinical symptoms of recurrent mania, failed to agglutinate the same organism. The clinical symptoms, the leucocytes and the agglutinative action in the adolescent cases, compared with the same symptoms in acute continuous mania, show a striking resemblance. Everything points to the fact that they are the same disease process modified by the age of the patient. The author treated on purely empirical grounds four cases of adolescent mania with antistreptococcus serum. While injected subcutaneously the serum produced no result, when given in 10 c.c. doses by the mouth, the following were the results obtained: In Case I there was absolutely no result. In Case II, within thirty minutes of the administration of the serum, the patient became quieter, the pulse fell from 10 to 15 beats in the minute, and the temperature fell 1°, but the course of the attack was not arrested. In Case III, within fifteen minutes of the administration of the serum the patient regained self-control, the pulse and temperature fell and the effect lasted for about two hours. A second dose of 10 c.c. arrested the attack. Two subsequent attacks were arrested in the same way. The patient made a good recovery, which the author attributes to the action of the serum. In Case IV the administration of the serum also seemed to arrest the attack. The author believes that this empirical experiment lends support to the view that acute mania is an infective disorder.

The Pathogenesis of Disease Following Unsuccessful Attempts at Hanging.—A detailed study of three cases of insane individuals who made attempts at suicide by hanging, but were rescued, was undertaken by W. ALTER (Monatsschrift f. Psychiatrie u. Neurol., July, 1903). All three had been cut down after a relatively short time of suspension and resuscitated. They presented absolute unconsciousness. One breathed spontaneously, in the others artificial respiration was necessary. Pulse in Cases I and III good, in II small, in all rapid; the pupils dilated but

still react. In from twenty to thirty minutes phenomena of motor irritation set in, in II and III accompanying the improvement in respiration. These phenomena began characteristically in all three with tonic and clonic twitches, passing into general convulsions accompanied by enuresis, biting of tongue and opisthotonus. Remarkable are the kicking movement of the legs and the waving of the arms seen in Case II, in which strangulation had continued the longest. This condition is soon followed by a catatonic rigidity of the entire body with contractions of the sphincters. The motor unrest in Case II is repeated twice in the course of three or four hours. All three cases wake up suddenly but reveal a certain amount of cloudiness of consciousness. A marked amnesia for the attempted suicide and its consequences is present in all cases, lasting for from two to six days. A certain amount of retrograde and anterograde amnesia is present. Motor unrest continues for a variable period. The clinical manifestations, as above detailed, represent, in the author's opinion, an intoxication psychosis of the acutest form—a transitory psychosis in the sense implied by Wernicke. They originate in a lesion of cellular elements whose extent is dependent upon the duration and extent of the strangulation, the cells damaged being chiefly those of the cortex cerebri and to a less degree those of the interior of the brain. Hence there result epileptiform attacks, convulsions and the complicated stereotyped motile phenomena, which may be regarded as the result partly of irritation and partly of degeneration. A hysterical individuality can influence but not originate the clinical picture.

Changes in the Nervous System in Porencephaly.

—The paucity of the cases in which a detailed study of the changes occurring consequent to porencephaly, has been made, imparts considerable value to the investigation made by J. O. W. BARRATT (Jour. of Mental Science, July, 1903) on a case of porencephaly which, without any history of traumatism, began at the age of eleven months with eclampsia, and with the continuance of this condition, terminated in idiocy. At thirty years of age the patient was admitted to the asylum and died nearly three years afterward. At autopsy the following changes in the nervous system were found: There was a defect in the brain mantle on the left side involving the apiculus, the island of Reil and the superior temporal convolution. The floor of this area was formed by the subjacent white matter which was very defective in medullated fibers. The left hemisphere was small and had contracted upon the area of defect, the left temporal lobe, seen from below, was also defective in size. The inferior longitudinal bundle on the left side was defective. As the destructive lesion of the temporal lobe was confined to the superior temporal convolution, it follows that the defective nerve-fibers arose in this gyrus. The caudate and lenticular nuclei were unaffected. The left optic thalamus was atrophied, the atrophy involving the lateral median and ventral nuclei (especially the latter) while the anterior nucleus was unaffected. The left optic radiation was atrophied. The atrophy of the optic thalamus was entirely dependent on the cortical lesion, being outside the vascular area involved in the latter. The cortico-spinal and thalamospinal tracts coming from the left hemisphere were markedly wasted in the mesencephalon, pons and medulla in comparison with the corresponding tracts of the other side. The cerebellum was normally developed. The spinal cord exhibited a defect of the left antero-internal column, while the right anterolateral column was of defective width opposite the base of the anterior horn. There was also diminution in size of the right anterior horn. The

lesion was obviously vascular in origin, corresponding very closely to the area of distribution of the left middle cerebral artery—which must have been blocked just beyond the point at which the lenticulostriate branches are given off. The blocking may have been the result of an embolus detached from a cardiac valve exhibiting vegetations, for at the autopsy valvular heart disease of old standing was found.

HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

Researches on Tetanus.—The results obtained by H. MEYER and F. RANSOM (Proc. of the Royal Society, July 8, 1903) include an experimental explanation of so-called local tetanus, a satisfactory interpretation of the period of incubation, the discovery of a form of tetanus confined to the sensory system, called tetanus dolorosus, a theory of the action of tetanus toxin and a definition of the sphere within which the serum treatment of tetanus is effectual. The authors believe they have succeeded in demonstrating that the transport of tetanus toxin to the central nervous system takes place only by way of the motor nerves, on the basis of the following experimental proof: (1) Toxin was found in the motor nerve after subcutaneous injection in a hind leg; (2) the endangered spinal centers can be protected if the passage of toxin along the motor nerve be blocked by means of antitoxin injected into the substance of the nerve; (3) if a lethal dose of tetanus toxin be injected into the sciatic nerve of a cat, the first symptom is a local tetanus of the muscles of the injected limb. This is followed seriatim, after a certain period during which the other hind leg is usually attacked, by tetanus of the trunk, fore legs, muscles of the neck. Such a progression of the disease from the hinder to the fore parts of an animal, can, under certain conditions, be prevented by section of the spinal cord. (4) A dose of toxin which, if introduced under the skin, causes no, or but slight, symptoms, is often sufficient to produce death if injected into a motor nerve. (5) Even when the blood contains a large quantity of antitoxin it is still possible to produce tetanus by injecting toxin into a motor nerve, although, under similar circumstances, subcutaneous or intravenous injections call forth no symptoms whatever. As regards the period of incubation, the authors find that the greater part of this is the expression of the time occupied in the conveyance of the toxin from the periphery along the motor nerves to the susceptible centers. The exaggeration of the reflexes and the characteristic tetanic rigidity of the muscles are due to the action of the toxin on the nervous centers to the entire exclusion of the periphery. In the experiments with injection of tetanic toxin into the substance of the spinal cord, the authors observed, as the first symptom of intoxication, an extremely remarkable sensory disturbance which remained strictly localized, even when the muscular rigidity and the exaggeration of the reflexes were becoming general. In several cases this was so great as to lead to death even before the ordinary symptoms of tetanus were clearly developed. This symptom, known as tetanus dolorosus, consisted in extreme hyperesthesia of some part of the periphery corresponding to the spinal center into which the injection had been made. This overirritability of the pain-reflex apparatus never occurs after simple subcutaneous or intravenous administration of the toxin, nor after administration into a nerve trunk. On the other hand, if the toxin be administered direct into a posterior root the result is pure tetanus dolorosus, thus indicating that the spinal ganglion forms an insuperable obstacle to the transport of the toxin. The reflex

answer to the attacks of pain consists in coordinated defense movements, i.e., brain reflexes. The pain apparatus in the spinal cord is so insulated from the motor that an intoxication of the one group cannot go over to the other. The actual movement of toxin in the nervous system takes place not in the lymphatic but in the protoplasm of the nerves. The toxin may possibly be carried centralwards in a sensory nerve, but sensory disturbance cannot be caused in this way. The heart-retarding centers of the vagus are susceptible to tetanus toxin. The tonic rigidity of the muscles and the exaggeration of the reflexes are due to entirely different and independent processes. Reflex tetanus is known to be a discontinuous series of contractions of short duration. The tetanic rigidity of the muscles, on the other hand, is a continuous and gradually increasing shortening, which may, however, regress. This shortening, when it has existed twenty-four to thirty hours is not affected by curare nor by section of the nerve. The theory of experimental tetanus intoxication assumes that the toxin is taken up from the point of injection by the motor nerves. Passing along these it reaches first the motor centers in the cord and excites there an overirritability, so that the discharges, which in the norm only give rise to the so-called muscular tone, become abnormally strong (although not reaching the maximum at first). The extensors and flexors of the injected limb brace themselves more and more and in the hind limbs the extensors tend to overcome the flexors. This, however, takes place gradually, so that for a considerable time voluntary and reflex movements can be executed. It may be said that tetanic rigidity is an intensified muscular tone in the affected limb. The excess toxin is next carried in the fibers of the cord to the motor apparatus of the corresponding limb of the other side. After a time, and if enough toxin has been given, the nearest connected sensory apparatus of the reflex arc in the spinal cord is attacked, with the result that the general reflex movements following irritation of the injected limb or its nerve are exaggerated, though from all other parts of the body normal reflexes are excited. The authors found in repeated experiments that when tetanus toxin was introduced direct into a motor nerve, antitoxin, though present in large quantities in the blood, was unable to prevent the outbreak of the disease or even to hinder a fatal issue. They conclude that injected antitoxin does not reach the substance of the nerve fibrils and centers, and that even with highly immunized animals the neurons remain free from antitoxin. As regards the value of the serum treatment of tetanus, it is clear that any toxin which is already in the nerve substance, though not yet in the spinal cord, cannot be reached and neutralized by antitoxin, whether given under the skin or direct into the blood. An attack corresponding to the amount of toxin absorbed by the nerves will infallibly break out and run its course in spite of the antitoxin. On the other hand, the toxin still in the blood and lymph will be rendered harmless by an injection of antitoxin, the absorption of fresh toxin from the infected wound hindered, and in this way an otherwise fatal result may be prevented and the life of a tetanus patient saved.

The Immunizing Effects of the Intracellular Contents of the Typhoid Bacillus.—It has been shown by Allan Macfayden that it is possible to disintegrate mechanically the typhoid bacillus at the temperature of liquid air and to obtain the cell-juices of the organism. In inoculation into animals these cell-juices proved toxic or fatal. It was, therefore, concluded that the typhoid bacillus contains within itself an intracellular toxin. The same author (Proc. of the Royal Society,

Vol. LXXI, No. 473), in testing the typhoid cell-juices for immunizing and other properties, finds that by their injection into the monkey it is possible to obtain a serum with both antibacterial and antitoxic properties, and that such a serum possesses curative and preventive properties as regards the typhoid bacillus and an intracellular toxin present in the same organism. The author believes that this research has afforded for the first time proof that, in the case of one species of pathogenic bacterium, the intracellular juices of the organism, when injected into a suitable organism, give rise to the production of a serum which is both bactericidal to the organism itself and antitoxic as regards a toxin contained in its substance.

Cytodiagnosis in Pleural and Peritoneal Exudations.—The diagnosis of the character of an exuded fluid into one of the serous cavities of the body has received a valuable aid by the examination of the cellular elements deposited in it. This is especially true in tuberculosis, for despite staining for bacilli, animal inoculation, tuberculin test and the more recent agglutination, we still lacked a quick and certain method of diagnosis. A critical review upon the advantages of cytodiagnosis based upon a large number of experiments, is found in the careful dissertation of L. v. KETLY and A. J. TORDAY (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 1 and 2). In primary tuberculous pleurisy, the deposit consists of a large number of small lymphocytes mixed with more or less red corpuscles, throughout the entire course of the disease, while endothelial cells occur only in few numbers. The same holds true for secondary, acute, tuberculous pleurisy except that in the first few days there may be predominance of polynuclear cells and endothelial elements. A chronic tuberculous pleurisy can hardly be distinguished from the chronic processes accompanying Bright's disease or heart trouble, by means of cytodiagnosis since polynuclear cells, lymphocytes and endothelial cells occur in varying numbers in both and disintegration very often does not permit one to discern the character of the cells. The ascitic fluid of Bright's disease and endocarditis contains many endothelial cells and later lymphocytes and still later there may be close resemblance to the deposit in chronic, secondary tuberculous pleurisy. The exudate following a pulmonary infarct, if chronic, hardly differs from that of nephritis. Pleurisy due to the pneumococcus gives a fluid containing many polynuclear leucocytes and endothelial cells. Cytodiagnosis is thus of value particularly in the diagnosis of primary, tuberculous pleurisy. An acute onset with marked lymphocytosis is characteristic here. Where the course is chronic, however, one must rely more upon the clinical aspect of the case. Cytodiagnosis will thus aid in giving a prognosis in acute cases, while it will not materially influence the treatment.

Pathology of Tetany.—As a result of clinical observation on 77 cases, and careful autopsy on seven, with microscopical examination of the cord and nerve-roots, R. PETERS (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 1 and 2) reports as follows on the anatomical changes in tetany such as is common in children from three months to three years: Tetany is not a functional but an organic disease. Its chief lesion is on inflammation of the extradural connective tissue which invests the dural sac and is continued through the intervertebral foramina around the nerve-roots and ganglia. This external pachymeningitis is really a small-celled infiltration with hemorrhages or else there are fibrinous deposits or colloid infiltrations in disseminated plaques. The vessels are also pathologically altered and bleeding takes place by preference between the ganglia and an-

terior roots while the pachymeningitis is most marked about the roots, especially the seventh and eighth cervical, the lower lumbar and the upper sacral. Secondly, an interstitial neuritis and gangliitis develops. The former affects only the extradural portion of both motor and sensory roots; the latter amounts to a proliferation of the intracapsular endothelial cells, with infiltration of round cells and karyolysis of the ganglion cells. The interstitial infiltration and the pachymeningitis itself are characteristic for tetany and the most severe cases have the most intense lesions. Concerning etiology, tetany is probably most often caused by measles, influenza and pneumonia but it is also possible that there is a specific micro-organism or that leucomaines and ptomaines liberated by auto-intoxication exert their injurious influence upon the nerve-roots. In conclusion, a new symptom of tetany is described: If the anode of a current of three or four milliamperes is placed upon the chest, and the cathode upon the fifth, sixth or seventh cervical vertebra, rapid twitchings will occur in both upper extremities at each closure.

Osmic Acid in Clinical Microscopy.—The undoubted value of osmic acid in clinical microscopy has been repeatedly demonstrated, but has never been widely employed in general daily practice. C. POSNER (Berl. klin. Woch., Aug. 10, 1903) calls attention to its use in quickly fixing the living cells of the body fluids, as a substitute for heat or other agents. For this purpose he employs the fumes which come from a few crystals of the acid placed in a dark colored bottle. The stopper of the latter is removed and the object carrier or slide is held over the open mouth for a few seconds, care being taken that the fumes are not inhaled. The preparations are then dried in the air and stained directly, washing or other preliminary measures being unnecessary. The method is very efficient for the examination of the blood but the author has applied it more particularly in the examination of urine. Pus from the urethra shows much more distinctly than with any other method, the intra- or extra-cellular location of the cocci, while the cells are not distorted and the nuclei are very distinct. Urethral shreds, which are ordinarily very difficult to demonstrate satisfactorily, are fixed and stained faultlessly and quickly. The same applies to the examination of prostatic secretion. The method seems to be particularly applicable to the demonstration of urinary sediments,—the outlines of the leucocytes are well preserved and the nuclei are uncommonly well stained. The red and epithelial cells, bacteria and even the crystals remain in their natural condition. It is also possible in many instances, to stain the casts, although the results frequently vary in a way which cannot at present be explained.

Active Substances of the Colon Bacillus.—Two principles could be isolated from the bouillon cultures of the colon bacillus by A. CAREGA (Centralbl. f. Bakt., Vol. 34, No. 4), one a nuclein and the other a nucleo-albumin. The nuclein is a toxic substance with cumulative action; the smallest fatal dose is two centigrams per kilogram body-weight. A specific agglutinating principle against this substance is not formed in the blood-serum. The nucleo-albumin is also toxic but not cumulative; the fatal dose here is six centigrams per kilogram and the blood-serum acquires a specific, agglutinating property. Upon analysis, the nucleo-albumin is found to consist of two substances, a toxophor principle, destroyed by heat, and an agglutininogen, indifferent principle, not affected by heat. The toxophor group plays no part in the agglutination. It is impossible to immunize rabbits against the colon bacillus with the nucleo-albumin.

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TREATMENT OF ANEURISM.

ONE year ago, Dr. Rudolph Matas, of New Orleans, announced a characteristically ingenious method, which he had devised and put into successful practice, in the treatment of operable aneurisms. Insufficient time has elapsed since the operation was first described to permit accumulation of the statistical data necessary to establish its general value, but that it has proven attractive and serviceable to American surgeons there is evidence.

The following is quoted from Brewer's recently published Manual of Surgery, "Rudolph Matas, recognizing the ready adhesion of sutured serous surfaces, advises after compression of the main supplying arterial trunk incision into the aneurismal tumor, removal of the clots and fibrin, and closure of the arterial orifices by sutures so placed as to ensure broad approximation of the margins of the openings. In sacculated aneurisms he closes the single orifice of communication between the artery and aneurismal sac, and thus restores the main vessel. In certain fusiform aneurisms he constructs a new channel by suturing the walls of the sac over a rubber catheter in the same manner as the Witzel method of gastrostomy is carried out. After all of these procedures he obliterates the remaining portion of the aneurismal cavity by

closely approximating its walls by suture. He claims that this procedure is safer than the other methods: that the wound heals more promptly and that in some instances the artery is restored to its original dimensions."

A review of a masterly monograph on the operative treatment of aneurism, in the April number of the *Deutsche Zeitschrift für Chirurgie*, by Jacobsthal places one in accurate possession of the best manner of treatment, as determined by comparative statistics. In conclusion he says, "Extirpation is without doubt the ideal method. Unfortunately it is applicable only in chosen cases. If the aneurism is not thrombosed but, rather, thin walled and pulsating, extirpation can be advised only if the tumor is small and of slow growth. If extirpation is not possible the next best treatment is proximal ligation. If consolidation of the sac does not follow proximal ligation, distal ligation is indicated. In those cases where only distal ligation can be practised the prospect of a permanent cure is remote. In far advanced inoperable cases, Macewen's procedure of needling and scratching the aneurismal wall is indicated. Electrolysis and puncture by wire must not be forgotten, as Thorburn has recorded marked improvement in a case treated by the former technic. The value of gelatin injections is not yet definitely decided."

Although these conclusions do not differ from those advanced by most recent text-books on surgery, they are instructive in that they are based upon the usual firm foundation of German statistics. In a word, they show that the surgical treatment of aneurisms has remained very nearly stationary for a great many years. So much the more credit is due Matas for creating a technic which, although gaining recognition here, has not yet penetrated the self-sufficient conservatism of the continent. It is particularly unfortunate for completeness of Dr. Jacobsthal's article that Matas' contribution—the only one published in recent years which appears to mark a distinct advance—should have been wholly omitted from his full bibliographic citations of ninety-four papers referred to by the able author.

What the future holds in store for this operation is a problem that can be answered only by time. Naturally some difficulty might be anticipated in its application to those aneurisms in which, as unfortunately is often the case, extensive atheromatous or calcareous degeneration has taken place. The justice of this criticism, however, is denied by Matas.

It is earnestly hoped that all surgeons having

interest in the operative treatment of aneurisms will consider this technic so that by their conjoined opinions its worth and limitations may soon be definitely known.

THE LIQUOR PROBLEM IN THE SCHOOLS.

A FACT that is not generally known even to many of those who are deeply interested in the various aspects of the liquor problem—social, ethical, economic, and physiological—is that there has been a Committee of Fifty investigating different phases of this important subject for nearly a decade.

As the result of their investigations a number of reports have been published; the first one of which, *The Liquor Problem in Its Legislative Aspects*, was given to the public in 1897. This was prepared under the direction of President Charles W. Eliot, of Harvard, President Seth Low, of Columbia, and Hon. James C. Carter, of the New York Bar, who make up the legislative subcommittee of the Committee of Fifty. In 1899 a Volume on Economic Aspects of the Liquor Problem was published as the report of the economic subcommittee, and in 1901 the ethical subcommittee, consisting of Professor Francis Peabody, Dr. Elgin R. L. Gould and Professor William M. Sloane, published *Substitutes for the Saloon*. The personnel of these subcommittees will serve to indicate how representative in its practical intellectual character is the constitution of the General Committee of Fifty. Physicians who are interested in the liquor problem then, and what physician is not, will feel it a duty not to miss the committees' reports.*

Just at the present time their interest can scarcely fail to be aroused by the report of the subcommittee which had in hand the investigation of the physiological aspects of the liquor problem. The directing members of this subcommittee are Professor W. O. Atwater, of Wesleyan University, Dr. John S. Billings, formerly of the Surgeon-General's Library, now of the New York Public Library; Professor H. P. Bowditch, Professor of Physiology at Harvard; Professor R. H. Chittenden, Director of the Sheffield Scientific School of Yale University, and Professor W. H. Welch, the Director of the Pathological Department of Johns Hopkins University. It is evident at once to anyone who is familiar with American Science that the investigations of such men are very likely to prove eminently helpful in

the elucidation of this important problem, and as the treatment of the supposed physiology of alcohol has in the past almost, as a rule, been obscured by prejudice and partiality, it is very clear that this report can scarcely fail to be of very lively interest and far-reaching significance.

The first monograph in the collected report treats of physiological instruction, as it is at present attempted in the public schools. The subject is treated by Professors Bowditch, of Harvard, and Hodge, of Clarke University, Worcester, Mass. They are able to find very little that is favorable to say of present-day methods of teaching and of the approved text-books of physiology as far as regards their treatment of this subject. By a series of what the *New York Sun* used to call "deadly parallel columns" they show how the opinions of standard physiologies have been garbled, important portions omitted and only certain unfavorable passages selected in order to create that peculiar text-book—"The School Physiology"—that shall succeed in satisfying the requirements of the Women's Christian Temperance Union. Even Professor Hodge himself has been quoted to this effect, "Alcohol always lowers working power and in some degree interferes with growth." With reference to this purported quotation, Dr. Hodge is able to deny that it occurs in any of his public writings or elsewhere, so far as he knows. He has certainly not drawn any such sweeping conclusion from his own experiments.

This is only one example of the flagrant way in which scientific and educational confidence has been abused in the making of these text-books. It is no wonder, then, as the collation of the opinions of a number of teachers in many States makes clear, that these text-books do not appeal to them, and, in fact, to many seem rather calculated to produce an unfavorable rather than a favorable effect as regards the cause of temperance. One New York teacher has stated his conviction in the matter very forcibly, and as his opinion is that of many others who have considered the question seriously it seems worth while quoting. He says:

"The text-books are worse than useless. They defeat the very object for which the Women's Christian Temperance Union labors. They entirely suppress the few beneficial effects of alcohol and unduly exaggerate the evil effects. All youths pass through an age of unbelief, of cynicism, of agnosticism. This age generally comes during the latter part of the High School course. When

* *Physiological Aspects of the Liquor Problem*. 2 Vols. Houghton, Mifflin & Co., New York and Boston.

they learn from authoritative sources of the benefits of alcohol, the reaction is marked. They immediately question the truth of the evils of alcohol and term what the books teach 'a lie.' Such has been my experience."

The conclusion of the committee as to the teaching of the physiology of alcohol in the public schools is as follows:

"It does not seem to this subcommittee desirable to attempt to give systematic instruction to all children in the primary schools on the subject of the action of alcohol or of alcoholic drinks. To older children, and especially those in the high schools, it does seem proper that instruction should be given as to the principal facts known about the use and effects of alcoholic drinks, the sociological and especially the ethical relations of the subject, the means which have been tried to prevent the evils resulting from alcoholism—and the results,—the object being to enable them to form an intelligent opinion upon the whole subject, especially to distinguish between mere assertions and scientific evidence."

This conclusion would it, seems to us, appeal to all those who are seriously interested as regards the instruction of youth in the liquor problem. The question of the evil of alcohol is rather sociological and ethical than physiological. To attempt to put it on a purely physiological basis is to invite the inevitable reaction against pseudo-science and debase and besmirch the dignity of true teaching.

There are many other interesting articles in this report. Professor Chittenden, for instance, discusses the influence of alcohol and alcoholic beverages on digestion and secretion. Dr. John S. Billings treats of the relations of the drink habit to insanity and furnishes data relating to the use of alcoholic drinks among brain-workers in the United States. Professor Atwater has a long and very valuable article on the nutritive value of alcohol. Some of his conclusions have already been the subject of no little discussion in the daily press. A very interesting, though brief communication, is that by Professor Bowditch, on the use of temperance drinks. Not a few of the tonics that even the "unco guid" and temperate may use with perfect propriety contain notable percentages of alcohol. As Professor Bowditch puts it, "It is clear that very large quantities of drinks, containing a greater proportion of alcohol than the ordinary wines and beers, are consumed among the most rigorous of total abstinence circles and one of the foremost advo-

cates of total abstinence has permitted her picture to be used as an advertisement of one of the most alcoholic of these drinks."

It is to be hoped that this report with its thorough treatment of so important a question as the liquor problem will meet with the attention it deserves, and that the result of it will be an improvement in the present methods of teaching physiology in public schools, and, above all, that the precious information thus given will serve to put an end to the present ill-directed educational crusade on the liquor problem, which is at least as likely to do as much harm as good and probably has actually been an incitement to the trial of things condemned so severely, yet so commonly used, under the eyes of pupils, since the inevitable impression was sure to be created that if people around them took the risks they did in the matter of alcoholic drinks it must surely be because there was some wonderful attraction and some alluring satisfaction in them.

THE MUTTERINGS OF THE ZEITGEIST.

REMOTE, indeed, are the regions into which the keen knife and the keener eye of the abdominal surgeon have not pierced. He has wrested every subtle secret from the coy and retiring appendix; he has shown that the possession of the gall-bladder is a display of unnecessary organic wealth; with deft and fateful hand he has drawn aside the veil which guarded the mysteries of the pancreas from the outer world, and sought to invade the forbidden precincts of digestion itself.

So great and so rapid was this progress that at one time it seemed inevitable that the unfortunate followers of these men would be afflicted with surgical ennui; be cast, nilly-willy, into a sort of surgical nirvana. However, the fog has again settled over the operating table; again, like the apostle, "we see as through a glass—darkly."

This state of things has arisen from the efforts of a few surgeons to take from the internist the majority of the cases of gastric disease. If we are to believe the words of the surgical Zeitgeist, the only sufferers under the new régime will be the manufacturers of dyspeptic tablets. This "time spirit" proclaims a relief of all kinds of perplexing dyspepsia by some simple, speedy and innocuous intervention. If the toiling and weary practitioner greets the announcement that he no longer will be called upon to prescribe pepsin, pancreatin and charcoal, with pleasure, what lusty cries of joy will rise from the public throat when it hears of its emancipation! The average

man does not like to take ichthyol for a stomach-ache till he smells to his friends and tastes to himself like an unseaworthy mossbunker fishing craft. When once educated he will easily prefer a little rift in his belly wall through which the ache may be reached. His stomach, where pleasure and pain sit cheek by jowl, is to the layman the most important and precious organ of the body. It has been pretty clearly demonstrated that most of the so-called *dyspepsia* is simply the clinical evidence of some remediable variation from the normal position, contour or size of the stomach or its parts.

Save in the rarely diagnosed condition of early neoplastic growth the mainstay of the surgical relief for the majority of these cases lies in the establishment of permanent fistulous openings. This is true, whether the condition is an inoperable carcinoma of the pylorus or any one of the many so-called simple diseases of the stomach. It is therefore easy to appreciate the importance, as well as the growing need, of some form of technic which, from a surgical standpoint, will most fully meet the requirements. That this standpoint is a broad one and difficult of fulfillment is attested by the great number of methods which have been devised. A modification of one of the most ingenious is presented in this issue (See page 483). There may be in this work the germs of a technic which will have world-wide application.

ECHOES AND NEWS.

NEW YORK.

Entertainment for the Insane.—Dr. E. C. Dent, Superintendent of the Manhattan State Hospital on Ward's Island, deserves great credit for the Labor Day program he prepared for the recreation of the unfortunates under his care. A printed schedule of the events had been prepared in detail and the patients as well as visitors enjoyed the afternoon's sports in the fullest degree. Such diversions for the disordered minds effect more good than barrels of drugs.

Examination of Imported Foodstuffs.—Acting on the instruction of the Secretary of the Treasury, and at the request of the Department of Agriculture, the Collector of the Port of New York had sample packages of a number of shipments of foods, including preserved fruits and vegetables, taken from the Public Stores. These will be sent to Washington for examination by the experts of the Department of Agriculture. The consignees of the shipments will be asked to call at the Custom House and make statements as to the purity of the goods imported. These statements will be forwarded with the goods. The first instance of the Government's refusal to admit to this country adulterated wines, under the Pure Food Act, took place last Saturday when entry was refused of a shipment of white wine from Bordeaux,

France. Upon analysis this wine was found to contain salicylic acid.

Asepsis at the Soda Fountain.—The movement by the Board of Health to enforce more perfect cleanliness in barber shops is wholly commendable and no objection has been met except among the most ignorant. The same authority might be advantageously exercised over the popular soda fountains and its utensils. In one of the largest retail drug stores in New York, where the sale of soda water is made a specialty, dirty glasses removed from the counter, were placed beneath a faucet of running water and shaken about for a few seconds and then refilled with soda water for the next customer. Even in one's own home, where the danger of infection is, to a certain extent, a known quantity, one insists upon having the glasses that are removed from the dinner table at least washed with soap and hot water. How much more should similar cleanliness be observed in a place frequented by the general public. The simple immersion of the glasses in an antiseptic solution, which should not be scarce in a drug store, for five minutes and subsequent rinsing with plain water would remove all danger and would assure the customer that he was getting nothing with his soda that he had not paid for.

PHILADELPHIA.

Philadelphia Hospital.—Dr. Fred. S. Johnson has been elected to the position of Assistant Chief Resident Physician. Dr. Johnson is a former interne of the institution and takes the place made vacant some months ago by the resignation of Dr. G. E. Pfahler.

Additional Means to Prevent Spread of Smallpox.—Announcement is made by the Department of Public Health that hereafter all the inmates of a house in which smallpox appears shall be taken to the Municipal Hospital with the patient. After twenty-four hours, during which they have undergone a disinfecting process, they will be returned to their home which in the meantime will have been thoroughly disinfected.

New Medical Society Formed.—Physicians of the Cumberland Valley, including Franklin, Cumberland, and Adams counties of Pennsylvania, and Washington county, Maryland, met at Mount Alto Park September 8, and organized the Cumberland Valley Medical Society. The program of the meeting included papers on tuberculosis, organization, professional sociability, and hemorrhage in typhoid.

Death of First Woman Physician.—Dr. Emily R. Robbins, who is said to have been the first woman medical practitioner in this country, died in this city August 31 aged seventy-one years. Dr. Robbins was born in Philadelphia, of Quaker parents, and graduated in 1857. She practised for a time at Fort Madison, Iowa, afterward marrying a classmate. At the beginning of the Rebellion Dr. Robbins and her husband came to Philadelphia, where, during the war, she devoted most of her time to the wounded soldiers who were brought to the various hospitals here.

Typhoid and Filtered Water.—The number of cases of typhoid fever for the week ending September 5 was considerably less than during the preceding week. The greatest number of new cases, however, developed in two wards, the Twenty-first and the Twenty-second, which are supplied with filtered water. Some of the people who are opposed to filtration have declared that filtered water does not prevent typhoid fever. Filtration Bureau officials declare that these deductions are unfounded. They are positive that if all the drinking water of the city

was filtered, typhoid would disappear. They explain present conditions on the assumption that the patients drank polluted water elsewhere. Arguments against filtration, they say, should not be made until all the water consumed in the city is filtered.

Elaborate Nurse-supply System Planned.—The daily papers give an outline of an elaborate system of nursing projected by the Philadelphia School for Nurses. The movement is ostensibly in affiliation with the National Red Cross Society but appears to be really a scheme of the above mentioned school. Briefly, the plan includes an institution, probably an office building, near the center of the city which will be the home of at least 100 nurses; these nurses will answer calls not only within but outside the city, even to the remotest sections of Pennsylvania, New Jersey, Delaware, and Maryland; a rule of the house will be to ask no questions about fees, as none will be required; those who can afford may contribute to the expenses of the institution; the service is to include only those patients who are suffering from contagious diseases. This movement apparently has great possibilities but its prospective benefits to patients are greatly lessened by the nature of the training supplied by this institution. The course of training, we are informed, extends over a period of ten weeks only. In remote districts such nurses may be better than none at all, but on the whole it does not seem that the movement is calculated to add laurels to the nursing profession. This institution is graduating hundreds of nurses, so-called. Their short training may be of value in their own homes but it would seem an ill-advised movement that sends them broadcast over the country.

Municipal Hospital.—Dr. J. F. Schamberg has resigned the position of Assistant Physician. Dr. W. M. Welch has been retired as physician-in-charge and made consulting physician. Dr. Welch has been in charge of the hospital for a period of thirty-three years. During this time over 24,000 patients were admitted to the institution, 8,000 of which had smallpox. The greatest epidemic of that disease occurred during the winter of 1871-72, when nearly 2,400 smallpox patients were cared for at the hospital. During the thirty-three years not one nurse or physician contracted smallpox while attending to their duties in the institution.

CHICAGO.

New Medical College.—The opening exercises of the Dearborn Medical College, a new evening medical school, were held Sept. 1. The opening address was delivered by Judge R. S. Tuthill. The initial enrollment comprised 175 students. The President of the College is Dr. L. Blake Baldwin; the Secretary, Dr. James H. Wells. The College building is that formerly occupied by the Bennett Medical College, and later by the Chicago College of Pharmacy. A clinical building is now being erected.

Taxation of Medical Colleges.—A decision has been rendered by the Board of Review to the effect that medical colleges operated for profit shall be taxed on their equipments. Rush Medical College was taken under advisement; Hahnemann Medical College was not taxed; Chicago Homeopathic Hospital was taxed on \$4,000, and the American College of Medicine and Surgery, Bennett Medical College and Jenner Medical College on \$2,000 each.

Preparations for a Health Exhibit.—Commissioner of Health Reynolds has returned to Chicago after a trip to New York and the seashore. He has begun to make preparations for the Health Department's exhibit at the St. Louis Exposition. The work of the depart-

ment will be shown in a manner similar to that which won for Chicago the gold medals at the Paris and Buffalo expositions.

Improved Quality of Milk.—Now that the quality of the milk is becoming more satisfactory, the energies of the Milk Bureau are being concentrated on the proper handling of milk. Cleanliness and the sterilization of bottles and utensils will be insisted upon even more strenuously than quality. The milk scouts are doing good work in this direction. Many of them are physicians and appreciate the importance of sterilizing utensils used in the handling of milk. The small stores near public schools are being carefully inspected. Milk dealers are complaining that the stores are not sanitary and are demanding that the sale of milk from them should be suppressed. The sale of milk and cream in stores has increased immensely since the inadequate "one-delivery-a-day plan" has been in vogue.

Diphtheria.—The attention of the Chief Inspector of the Health Department having been attracted to the unusual number of reports of diphtheria cases in the south end of Cheltenham, a house to house canvass of the locality was made by Medical Inspector, Dr. H. M. Richter, who found a number of unreported cases; one fatal case in which the family had been told by the attending physician that the disease was croup and not contagious. At the funeral there was a large crowd, many being children. The funeral was the probable cause of three other cases; also a midwife recovering from diphtheria, said to have been attending cases of the disease in the neighborhood, and delivered a woman next door immediately after her premises had been disinfected. The facts in the cases of the falsely certifying physician and of the midwife will be presented to the State Board of Health at its next meeting. In other parts of the city there is only the usual number of diphtheria cases; scarlet fever, measles, whooping-cough and typhoid fever are either stationary or decreasing in prevalence.

GENERAL.

Trichinosis in Homburg.—In Homburg, Germany, and its vicinity two hundred persons are suffering from trichinosis.

William II. as Surgeon.—A piece of tree-bark about 18 to 20 inches long has recently been placed in a glass case in the Hohenzollern Museum in Berlin, which bears this inscription: "Tree-bark with which His Majesty, the Emperor, improvised a temporary splint for the arm of Her Majesty, the Empress, at the time of her accident in the Grünewald, March 27, 1903."

Another Medical Journal Passes Away.—With the issue of the August number, the *Quarterly Medical Journal for Yorkshire* closes its existence. Founded in 1892 as the *Sheffield Medical Journal*, it soon enlarged its sphere of action and assumed its later title. "During the eleven years of publication it has been the aim," so states its obituary, "of those responsible for it to maintain a high standard of medical literature." The editorial staff returns thanks to the public, but no definite reason is stated for its discontinuance.

Tuberculosis and Cigars.—The investigations of Perserico in Italy have shown that the stumps of cigars smoked by tuberculous subjects and kept dry for a period of two to three weeks are capable of producing tuberculosis in guinea-pigs. As an important result of these findings, the Cuban authorities now require that, in all cigar factories, a sponge shall be used in finishing off the ends of cigars instead of their being moistened with the lips of the operator as formerly.

Typhoid Epidemic at Metz.—There is an epidemic of typhoid fever at Metz, due to bad water, and this is the occasion for shutting off the city supply. The irri-

tation of the local authorities is due to the despatch of the Emperor William to Prince Hohenlohe-Langenburg, the Viceroy of Alsace-Lorraine, in which the Kaiser says the state of affairs, which threatens the health of the garrison, is due solely to the city administration of Metz, "which is absolutely unable to decide what steps to take with regard to its water supply. Since the time of the Romans the mountain springs at Gorze have supplied Metz with its water. A water famine prevails in Metz, and the hotels are unable to satisfy their wants."

Mont Blanc Place for Consumptives.—Prominent French physicians are now turning their attention to Mont Blanc and the Mer de Glace as possible sites for consumptive sanatoriums. Dr. Kass, director of the Paris Municipal Sanatorium, took a number of pauper consumptives to the Mont Blanc Observatory this week to study the effects produced on them during the month. Dr. Bayeux, of the Saint-Lazare Infirmary, is carrying out similar investigations on the Mer de Glace and has expressed the opinion that the disease can be coped with and perhaps cured by proper treatment there.

Pathology as Seen in Works of Art.—Dr. Paul Richter, the recently-appointed professor of anatomy in the Paris Ecole des Beaux-Arts, was formerly an assistant of the eminent specialist in nervous disorders, Professor Charcot, at the Salpêtrière. For him he made a number of sketches demonstrating hysterical symptoms. While doing this work he was led to adopt the maxim that there can be no perfect beauty without perfect health. He noted pathological features in many well-known works of art, and concluded that faulty models were responsible. He accordingly advises his pupils to avoid the usual atelier models, and seek for the lines of human beauty among the acrobats in the circus, the blacksmiths, and the partially nude laborers at the docks and in the fields. "Beauty in action" is his motto.

Longevity of Ministers.—It is the universal testimony that clergymen reach the highest age, being close run by gardeners and vine dressers. Ordinary agricultural laborers, although their occupation is so largely in the open air, are not conspicuous as long livers, except in France, Sweden, and England. People working with wood are longer lived than those whose occupations are with metals, and both attain a higher age than textile workers and workers in chemical industries. The shortest lived people are miners, except in England, where the superior mining regulations and admirable sanitary arrangements have a beneficial effect. In England and Norway sailors and fishermen live to a far greater age than in Germany and France.

The Bacillus in War.—The Macedonian revolutionists, it is reported, threaten, in case they cannot bring about a war between Turkey and Bulgaria, or induce European intervention, to decimate the populations of the Macedonian cities controlled by the Turks by poisoning the wells with the bacilli of the plague. This is really a formidable threat, easy of execution, terrible in its consequences, and picturesquely barbarous. The plague bacilli can be put up in soluble capsules of small size, and might be dropped into wells without attracting any attention. From the point of view of the advantage of the human race it is not certain that the depopulation of this part of the world by pathogenic bacteria would be an unmixed misfortune, but this consideration in no wise mitigates the fiendishness of the crime of planting the seeds of a subtle and uncontrollable infection in soil where it would linger for years, with almost inevitably fatal consequences to all.

Alarming Increase of Lunacy.—Dr. A. B. Hays, superintendent of the Louisiana State Insane Asylum at Jackson, La., believes in adopting the radical measures

to prevent insanity and points out that unless this be done the burden of caring for the insane will soon be too heavy for the sane to bear. In Louisiana insanity is increasing at the rate of more than 10 per cent. a year, or five times as fast as the population. When he took charge of the State asylum in 1896 there were 850 insane persons; there are now 1,550, an increase of 80 per cent. in seven years, while the population has grown only 15 per cent. Dr. Hays is in favor of radical legislation. He thinks the Louisiana legislature did well at the last session in prohibiting consanguineous marriage, to which he attributes a great deal of the insanity of to-day. The legislation against the sale of cocaine was also a move in the right direction, he thinks, and especially to the benefit of the negro race, who, under the influence of the drug, are driven mad by hundreds. The exhilarating or soothing effects of cocaine have brought other drugs into use among the negroes. Morphine, digitalis and half a dozen other poisons are slowly creeping into favor with them.

Deterioration in British Lower Classes.—The English Government has appointed a commission to inquire into the alleged physical deterioration of the lower classes in the United Kingdom. The clerk of the Privy Council is chairman, assisted by the former head of the Army Gymnastic School, the inspector of reformatories, the chief of the Navy Recruiting Service, statisticians, and others. The subject was brought up in the House of Commons by Sir William R. Anson, Parliamentary Secretary to the Board of Education, who declared that 60,000 children now attending London schools were physically unfit for instruction. The Director-General of the Army Medical Service reports that one man in every three offered as recruits had to be rejected. The appointment of the commission is hailed with approval. The *Daily Chronicle* says: "If the people as a whole are deteriorating, we must change our ways or give up the national struggle as a mistake. The creation and preservation of a fine stock of mankind is the first, perhaps the only reason for national existence, and if the mass of the people is going down hill in physique we may be quite sure it is going down hill in character and intellect as well."

"Cuban Plague."—During the past week much publicity has been given to a spurious report that a severe epidemic of yellow fever or some equally fatal infection had broken out in eastern Cuba and that its presence was being denied for political or commercial reasons. Unfortunately several of the more reliable representatives of the daily press gave prominence to the subject. The following denials from the Marine Hospital Service and from Dr. Guiteras make it certain that there is no yellow fever and suggest the inference that a few deaths from pernicious malaria have given the only foundation for the scare. Dr. Walter Wyman, of the Marine Hospital Service, which is maintaining a vigilant surveillance of the health of Cuba, states that no advices have been received from his agents diagnosing any sickness whatsoever as yellow fever. This statement is supported by a despatch from Minister Squiers at Havana, who says that the island has a clean bill of health so far as that dreaded scourge is concerned. His exact words are: "The whole island is free from smallpox and yellow fever." He adds: "In many of the provinces the death-rate has been abnormally low, owing to the improved methods of sanitation." Dr. Guiteras, who went to the Province of Santiago to investigate the rumors of plague there, telegraphs that there is no yellow or black fever or other epidemic at Santiago or Daiquiri. At Daiquiri there are some serious cases of malarial fever.

Child Labor in New Jersey.—On September 1, the new law concerning child labor in this State took

effect. It provides that no boy or girl under fourteen years of age shall be permitted to labor in any factory or workshop in any capacity whatsoever. The age limit is thus raised two years, the former act making it twelve years for boys and fourteen for girls. Last winter the legislature passed an act placing in the hands of Governor Murphy authority to enforce the law. The Governor has taken a decided stand in his public messages and speeches, and it is to be hoped that the present effort will be attended with success. At any rate it will give the public an idea as to the value of promises on the part of State authorities. The glass blowers of South Jersey, among whom child labor is at a premium, have threatened to contest the constitutionality of the new law, because of a silly provision in the act that it should take effect on September 1, without specifying whether it should be this September or some other September. While the failure to prescribe a definite date was either a stupid blunder of the legislature or a deliberate attempt to palm off an act that would not hold water, the department has been advised by the Attorney-General, it is understood, that the omission will in nowise affect the validity of the act. At any rate, the department has asserted its intention to insist upon compliance with the law and to prosecute all manufacturers who employ children under the prescribed ages. Since the technical objections to the act do not go to the merits of the measure, the factory inspector has taken the stand that all offenders should be prosecuted to the full extent of the law and this he says he is prepared to do.

Lepers Colony in Porto Rico.—A bad state of affairs has been discovered on Cabras Island, on which the leper colony of Porto Rico is located, at the entrance to San Juan harbor. As a result the Executive Council of Porto Rico recently held a special session, by request of Acting Governor Hartzell, and has ordered a thorough investigation. It has been believed, until this discovery, that the leper colony has been conducted in a manner most creditable to all concerned. The insular government has been expending about \$10,000 a year for its maintenance. Dr. Goenaga, acting director, found dogs, goats, chickens, rabbits, and pigs herded with the lepers, the chickens nesting in the unclean beds. The patients were in a filthy condition, with no bathing facilities and most of them clad in rags. The food supplies stood about exposed to corruption. In these surroundings he found two "patients," one an old man, and the other younger, who were not afflicted with leprosy. The old man was committed years ago as a leper, thus being consigned to slow and awful death, and the younger man was sent to the colony later. These men will be removed this week and especially quarantined in a building now being constructed, for a sufficient time to make their release safe. There are now in the Cabras Island colony twenty-three lepers, and at least as many more, it is believed, are scattered through Porto Rico. The Superior Board of Health, within whose province is the determination of this disease, has had many difficulties to contend with in its endeavor to deliver to the colony the balance of those afflicted and at large on the island. One of the difficulties is that of transportation after discovery, the common carriers absolutely refusing to bring the lepers from the surrounding country. The board is now trying to solve the problem by arranging for special oxcart transportation at government expense. It is hoped that within a year all the lepers of Porto Rico will be segregated at the colony.

Obituary.—Dr. James Hibbard, aged eighty-seven,

died in Richmond, Ind., September 8. He was an ex-President of the American Medical Association.

Report of the death at Harrenalb, in the Black Forest of Wurtemberg, Germany, of Dr. Joseph Schnetter, one of the founders of the German Hospital and Dispensary of New York, and for forty years an active practising physician in this city, has just reached his friends in New York through his late residence in the city of Karlsruhe, Germany. He was eighty-two years of age. Dr. Schnetter was born at Gerolzhoven, Bavaria, and was graduated from the University at Wurtemberg. Jealousies on the part of his fellow-students caused him to leave the university, where he was offered a professorship, and to come to America in 1849. He settled in New York. He became connected with many charitable institutions, among them being the German Hospital and Dispensary. In 1889 illness caused him to give up his practice.

Dr. Henry De Haven Cameron, late surgeon of Troop C, N.G.N.Y., died in Pony, Mont., on Friday, after a long illness. He was born in Brooklyn thirty-seven years ago and was a graduate of the New York College of Physicians and Surgeons. For a time he was an interne in the New York and Chambers Street hospitals, and later served two years in the Methodist Episcopal Hospital in Brooklyn, when he became well known professionally even before he commenced private practice. He was one of the organizers of Troop C in 1896, and was first appointed assistant surgeon, in which capacity he served several years. He returned from India, where he was traveling, at the outbreak of the Spanish war, and served with his troop through the Porto Rico campaign. When the troop was mustered out he was promoted to the rank of surgeon which he held to the time of his death. As a mark of appreciation of his services, he was presented with a sword and full riding outfit by the officers and privates of his troop. He was well known in Brooklyn and New York in the National Guard and in the medical profession. He was for years identified with the Methodist Episcopal and Norwegian hospitals. Owing to ill health, he was compelled to go to the far West, from which he returned improved, but still suffering from the conditions that finally caused his death.

Dr. Luis P. Walton, of New York, died suddenly September 8 at the Bath Club, in London. He had been swimming and on coming out of the water complained of feeling ill, and lay down to rest a while. He died within an hour of heart disease. Dr. Walton was a son of Dr. Henry C. Walton, an English practitioner, who came to New York in 1850. Dr. Walton was born in Liverpool just previous to the time of his father's removal to this country. He studied in the schools of New York, and, taking the medical course at the College of Physicians and Surgeons, was graduated in 1870. He spent several years in the college dispensary, and then began general practice, in which he was very successful.

CORRESPONDENCE.

BOTHRIOCEPHALUS LATUS.

THE following letter was forwarded to the MEDICAL NEWS by Dr. Berkeley, and is of interest in connection with his paper published in our issue of August 1.—[Ed.]

W. N. BERKELEY, M.D.:

DEAR DOCTOR—In answer to the request in your favor of August 23, I have obtained the following facts from

the patient and my own memory and books, in relation to the case of *Bothriocephalus latus* spoken of in my letter.

Nearly nine years ago (Sept. 4, 1894) the mother of the young lady who suffered with it came to my office, bringing some segments of the worm to ascertain what they were, stating that her daughter had passed them with her feces. Upon examination, I told her they were from a tapeworm, and that I would see the patient taking proper medicine and instructing her how to use it. A few days after I did so, and found she had passed other segments, which I saw and noticed that they were endowed with motion similar to the movements of the measuring worm. She stated that she had been passing them for about a week. She complained in no way except from an irritability of the nervous system, and after knowing her condition, with intense disgust at the idea rather than discomfort from it. A few days thereafter her mother brought to the office the whole worm with head, which had been passed by her, and which I still have. It was, I think, about 19 feet long (have not taken it from the bottle to measure now, for fear of damaging it). Segments very narrow and short, being about five-eighths of an inch long and one-half of an inch wide, then tapering in width to one-fourth of an inch, still being five-eighths of an inch long; the openings being all along the same side. I had administered pelletierine, with castor oil following, of course restricting diet. The patient does not have the least idea where she obtained it. Was in Europe several years before, and a tour to Egypt and Holy Land was taken several years after she passed it. She cannot tell how long she was afflicted with it, but I do not suppose she obtained it in Europe, being so long before she passed any segments.

I find there is a constriction of two or three segments in one portion of the worm, they assuming the form of those near the terminal end, and again becoming wider, assuming the shape previous to the constriction.

HORACE M. BELLOWES, M.D.

Huntington Valley, Pa., Aug. 29, 1903.

OUR LONDON LETTER.

(From Our Special Correspondent.)

LONDON, August 29.

THE DULL SEASON—DEATH OF A PROMINENT SANITARIAN—THE "SWEDISH CURE."

WE are at the height, or rather the depth, of the dull season, and in the Temples of Medical Science in Harley street and Grosvenor Square the oracles are dumb, or are replaced by understudies. This is the time when the young Lazarus of medicine picks up the crumbs that fall from the rich man's table. But everyone else is away; the medical schools are in recess, and silence reigns in the debating rooms of the Societies. The medical world should therefore be happy, for at present it has no history.

There is, however, one most experienced operator, not strictly belonging to the profession, though very intimately associated therewith, who never takes a holiday. In season and out of season he is at work, for, as Robert Burns says,

Folks maun do something for their bread
And sae maun Death.

He has just struck down one of our leading sanitarians in the person of Professor W. H. Corfield, of University College, London. After a brilliant career at Oxford he studied medicine in London and on the Continent. Early in the seventies he was appointed professor of hygiene in University College, being the first holder of such an appointment in London. To

him, too, the first laboratory of hygiene founded in London, that at University College, mainly owes its existence. He took a leading part in organizing the International Congress of Hygiene and Demography held here in 1891. He was a member of many foreign scientific societies, and was the author of several books dealing with matters within his special province. Among them may be mentioned a *Résumé of the History of Hygiene*; *Dwelling Houses: Their Sanitary Construction and Arrangement*; *Disease and Defective House Sanitation* (which was translated into French, Italian and Hungarian); and *The Etiology of Typhoid Fever and Its Prevention*. Two or three years ago he was appointed sanitary adviser to His Majesty's Office of Works. He had also a very lucrative practice as a consulting sanitary expert. He was an eager collector of old books, though he seemed, like most bibliomaniacs, to care more for the rarity and especially the bindings of his books, than for their literary quality. Still, he did know something of the contents of his treasures. He had a remarkable collection of woodcuts of Thomas Bewick, and a considerable number of choice prints. The story of his last illness presents some remarkable features. Two or three years ago he lost appetite and digestion; his frame, always small and spare, wasted to a degree recalling Falstaff's description of Justice Shallow ("I do remember him at Clement's Inn, like a man made after supper of a cheese paring"); his face had an earthy look—in short, he had all the appearance of a man suffering from advanced malignant disease. The seat of the pain and other symptoms suggested cancer of the stomach. All his friends thought he was dying. Suddenly a startling change took place. He was able to eat beefsteak without discomfort; his shrunken form filled out and his face recovered the ruddiness of health. He attributed his cure—for such it seemed to be—to a peculiar form of Swedish treatment consisting, as far as I could make out, in manipulations directed to stimulate the nerve ends over the area of discomfort. He was enthusiastic about the treatment, and must have been an excellent advertisement for the healer who had wrought such a wonder in him. But, alas! the vanity of human things is as strikingly exemplified in quackery which has, faith on its side as in orthodox medicine which leans on the broken reed of reason. It became painfully clear that the apparent "Cure" was but a temporary response to stimulation. Corfield did not, however, lose faith in vibration massage. Hope springs eternal in the human breast and he went to Sweden in order, I suppose, that he might get the treatment at the fountain head. He was looking about for some other shrine of healing when death brought his quest to a sudden end. He had not completed his sixtieth year.

The "Swedish treatment" is very fashionable here at present, and many professors of the art are earning incomes that make even successful physicians green with envy. The profession in this country, which is fanatically conservative, has always looked more or less askance at massage, and as far as the general body is concerned, it is only now beginning to realize that it has any value. Hence it comes about that this method of treatment is to a large extent in the hands of quacks, and is therefore looked upon by sticklers for professional purity as an unclean thing. This is regrettable from every point of view. There is much, as Dr. Wharton Hood has shown, to be learned from bone-setters, and the same may be said of the Swedish manipulators, *Fas est et ab hoste doceri*. The profession should imitate the example of Molière and take what rightfully belongs to it wherever it may be found. The doctors will be driven before long to recognize the logic of facts, but by that time their chance of captur-

ing the treatment and giving it the consecration of orthodoxy will be well-nigh gone. Already some of the leaders of the profession meet bonesetters and Swedish curers on the sly. They would of course say that they superintend the treatment, but the fact is that in the alternative presented to them of losing their patients or meeting the illegitimate practitioner, they prefer the latter course. The fashionable quacks are in a position to dictate their terms. One noted "Professor" who requires a dozen "operating rooms" and a large staff of assistants to meet the exigencies of his practice, has among his patients the very flower of English society, including the Royal family. It may be said that these people, being silly, are the natural prey of quacks, but among the clients of the masseur and the bonesetter are judges, generals, ecclesiastical dignitaries—in a word, the heads of every profession but the medical. And, as has been seen, even the bigwigs of medicine, like Professor Corfield, when in the grip of *ineluctabile fatum*, seek help from quackery.

SOCIETY PROCEEDINGS.

BRITISH MEDICAL ASSOCIATION.

Seventy-first Annual Meeting, Held in Swansea, July 28, 29, 30 and 31, 1903.

(Continued from Page 432.)

Pathology and Treatment of Chorea.—Dr. D. B. Lees said: "Our subject to-day is the pathology and treatment of that common disease of childhood which is so inadequately and incorrectly described by the name 'Chorea.' Inadequately, for there is much more than abnormal muscular movement in this malady. Incorrectly, for whatever else a choreic patient may do, there is a total absence of any rhythmic movement which might fairly be described as 'dancing.' It is most unfortunate that the name should wholly misrepresent the disease. Perhaps, when the pathology is completely understood, a better name may be invented. Meantime let us define our subject by excluding all varieties of hysteria, all forms of habit-spasm, and all irregularities of movement resulting from gross cerebral lesions, such as athetosis and 'post-hemiplegic chorea.' And in this section we neglect the rarer chorea of adults and of old age, and concern ourselves only with the so-called 'chorea' of childhood.

"The most obvious fact in chorea is disorderly muscular movement, spasmodic, clonic, irregular, involuntary, with imperfect control and coordination. If we observe carefully the distribution of these involuntary movements, we find that it is precisely the muscles over which we have most voluntary power that are most affected in chorea—the muscles of the face, those of the tongue, and those of the hands and arms. These are the muscles which specially express emotion—by grimace, speech, and the movements of the hands and arms which naturally accompany eloquent or excited speech, especially in the more emotional races. It is precisely these muscles which are most affected in chorea; the face, tongue, and hands are much more implicated than the proximal parts of the upper limbs, the upper limbs more than the lower, and the lower limbs more than the muscles of the trunk.

"Respiration, over which we have a real though limited control, is affected much more than the action of the heart, over which we have no voluntary power whatever. The heart's action may, indeed, be irregular in chorea, but it is much less so than the respiration, and the heart often works steadily enough while the breathing is quite irregular. Choreic movements are often more pronounced on one side of the body than

on the other, and in slight cases they may be limited to the limbs of one side. Choreic movements cease when the patient falls asleep, and recur when he wakes.

"These facts, taken together, indicate unmistakably a disorder of the brain, and specially of the motor centers. In the Rolandic area of the cortex much space is allotted to the movements which are specially under voluntary direction and control—to the face, hand, and arm—less to the lower limbs in proportion to their size, and comparatively little to the muscles of the back and of the abdomen. The relative affection of the different muscular movements in chorea corresponds to the cortex arrangement.)

"It is clear that in chorea these centers are in an abnormally excited state, for if you ask a choreic child a question, its hands will often reply before its mouth. Place the child at rest, with its arms and hands outstretched on the bed, and wait for a quiet interval when the choreic movements have ceased, or are at all events much diminished. Then ask the child a question, however simple, its name, or the number and names of its brothers and sisters. Usually the choreic movements recur at once in the hands, often before the reply is uttered, or if they have not previously ceased, they become very rapidly much more violent. It seems that the outgoing impulse to the speech center finds the adjoining centres of the motor area abnormally excitable, and overflows into them. Sometimes the choreic movements follow so quickly after the question that it almost seems as if the ingoing auditory impulse had reached them directly.

"Similarly, if the child squeezes an object firmly with one hand the other hand usually becomes more decidedly choreic. In a case of hemichorea, a strong squeeze with the unaffected hand brings out additional movements in the choreic hand, while a squeeze with the affected hand produces little or no effect on the other. This seems to indicate clearly that the hand center in the cortex on the one side is more excitable than that on the other.

"The motor centers are not only irritable, they are also weak. This weakness may be obvious from the first, but it is apt to become greater as the irritability subsides. The grasp is feeble, and the weakness of the whole upper limb may be so great as to deserve the name of paresis. When the hands and arms are outstretched, the child standing or sitting, there is usually a slight flexion of the wrist, apparently due to loss of tone of the special extensors, and the voluntary extensor effort of the common extensor of the fingers slightly overextends the first phalanges. It may be impossible for the patient to walk, to stand, to rise from the recumbent position, almost impossible even for him to lift one leg over the other.

"It is clear that in chorea much more than the Rolandic area of the cortex is affected, and it is probable that the whole brain suffers more or less. Is the cord affected also? If so, its affection is overshadowed by that of the brain, as in tuberculous meningitis. But one phenomenon is observed which may indicate an extra irritability of the spinal ganglion cells—an increase in the briskness of the knee-jerks and a tendency to a prolonged extension of the knee when the patellar tendon is struck. Possibly also the atonic condition of the wrist extensors may be of spinal origin.

"Are the peripheral nerves affected? Choreic children sometimes complain of flying pains in the limbs, away from the joints, which may possibly be neuritic. In some cases of chorea the knee-jerks cannot be obtained, though it is not certain that this is really a symptom of the disease, or how, if a symptom, it is produced. And the occasional occurrence of slight optic neuritis, mentioned by Sir William Gowers, must

also be remembered. It may be added that choreic children often suffer from constipation; the cause of this is uncertain.

"In chorea, then, there seems to be a disorder of the whole cerebral cortex, probably of the whole brain, possibly of the nervous system in general, sufficient to produce very definite symptoms, and often lasting for a long time. Yet the disorder is not a destructive one; it usually ends in complete recovery. The pathological changes are, therefore, if organic, of slight intensity, and it seems probable that the morbid state may be largely due to a toxemia. Yet the fact that the symptoms may be very definitely localized suggests that the cause cannot be simply a toxemia; there must be something focal as well. The changes found post mortem in the brains of the few cases which end fatally have been mainly confined to the vascular system—hyperemia, dilatation of vessels, perivascular leucocytes, thromboses, and slight hemorrhages. Alterations in the nerve cells have also been found by several observers. A recent investigation of two fatal cases by modern histological methods by Dr. Reichardt, of Chemnitz, showed small hemorrhages, irregularly scattered, with collections of leucocytes, chiefly mononuclear, and dilatation of vessels, with perivascular small-celled infiltration, in many parts of the brain, in varying amount. No changes were detected in the ganglion cells, but there were areas of fatty degeneration of nerve fibers; in the spinal cord the parts most affected were the root fibers and the anterior and lateral horns, and the posterior columns—the anterior and lateral tracts were free. Cultures from the fluid of the cerebral ventricles of the first case gave no result, but '*Staphylococcus aureus*' was obtained from the heart blood. In the second case there were '*Streptococci*' in the cardiac valves, and a few colonies of '*Staphylococcus albus*' were obtained from the brain.

"If we look for clinical evidence of a morbid blood-state in chorea, we find that it is frequently accompanied by manifestations of the toxemia which we call 'rheumatism.' Any of the ordinary rheumatic phenomena in a child may accompany chorea—tonsillitis, arthritis, erythema, nodules, cardiac dilatation, endocarditis, pericarditis, pleurisy. The most frequent of these is cardiac dilatation, for in chorea, as in rheumatism, the left ventricle is almost always too large, the left border of the heart extending beyond the left nipple line, often as much as one fingerbreadth, and the first sound being feeble. The next commonest is a systolic apex murmur; whether this is always due to valvulitis is uncertain, but in many cases it is so undoubtedly. In almost all fatal cases of chorea recent vegetations are found on the mitral valve. A fairly frequent evidence of rheumatism is the rheumatic nodule, single or multiple. The neighborhood of the various joints, also the tendons of the hands and feet, the occiput, and the vertebral spinous processes ought to be carefully examined for nodules in all cases of chorea. The other manifestations of rheumatism must also be borne in mind, and special care should be taken not to overlook a pericardial rub.

"I draw special attention to the fact that chorea is often the first of a series of rheumatic attacks. If this be ignored, and the relationship of the two diseases be based simply on the precedence of rheumatism, the connection of the two will inevitably be understated. It occurred to me that it would be worth while to investigate carefully the amount of subsequent rheumatism occurring within a few years after an attack of chorea in children who had had no rheumatism previously. Dr. Batten was good enough to investigate this point in the out-patient department of the Hospital for Sick Children."

"He found in 115 cases of chorea that whereas the percentage of previous rheumatism was stated to be only 32.2 per cent., three years later so many of them had subsequently suffered from rheumatism that the percentage rose to 43.5, and three years later still it had risen to 53.2, so that the lapse of six years had increased the percentage by 21 per cent. And this is below the truth, for after the lapse of six years as many as 38 of the 115 children could not be investigated. If the same proportion of these missing ones had become rheumatic, the percentage would be increased, not by 21, but by 28 per cent. This added to the cases of 'previous' rheumatism would give a total percentage of 60 per cent.

"The clinical evidence is in reality very strong, and we turn with interest to the excellent work of Drs. Poynton and Paine on the bacteriology of rheumatism to learn whether they can throw light on the pathology of chorea. I need not remind you that these observers, by a series of investigations, have isolated from the tissues in cases of fatal rheumatism, and also from the blood of rheumatic patients during life, a diplococcus which they have been able to cultivate, and which when injected intravenously into rabbits, has produced in them all the symptoms of a violent rheumatism in a child, and that a recent subcutaneous rheumatic nodule, excised with aseptic precautions two hours after death, at once immersed in a suitable medium and cultivated for forty-eight hours in an incubator, was found to contain an exuberant growth of this organism without the presence of any other. In my judgment these results are decisive.

"Accepting then the fact as now demonstrated that rheumatism is a disease caused by a diplococcus, and remembering its close clinical connection with chorea, we ask with interest whether this diplococcus is also responsible for the production of chorea. The evidence on this point is as yet scanty, but it is extremely suggestive. One of the rabbits injected with a culture of this diplococcus obtained by incubating pericardial fluid from a fatal case of rheumatism, developed symptoms remarkably resembling chorea in a child—clonic irregular involuntary spasmodic muscular movements, especially of the forelimbs and of the face, with a condition of 'nervousness' such that it started at any sudden noise. This rabbit was killed, and diplococci were found in the lymphatic sheath of the vessels in the pia mater and in the endothelial cells of the blood capillaries penetrating the cortex of the brain.

"A second fact is this. Dr. Poynton cut sections of the brain of a fatal case of chorea which had been preserved for three years, and found diplococci in the cortex itself, also in profusion in the mitral valve. These, however, were not cultivated, so that it is not proved that these were the rheumatic diplococci. Yet if we take these two facts together, and remember that Dana, Apert, Wassermann, and others have isolated a diplococcus from the brain in fatal cases of chorea, it becomes more than probable that before long the demonstration will be made complete. Fatal cases of chorea are happily uncommon, and it will require some time before the point can be proved.

"But if it has been shown that these diplococci are almost always found in the heart in fatal cases of rheumatism, and if they have actually been found in the blood during life, it seems certain that they must often reach the cerebral circulation. If their presence in the pial vessels and the cortex is the cause of chorea, we must look upon this disease as a microbic invasion of the brain, as in tuberculous meningitis. Why the result is so different in these two diseases must depend upon a difference in the virulence of the microbe, and the different measure of resistance on the part of

the phagocytes and other defensive mechanisms. In this respect some recent observations by Drs. Poynton and Paine are of interest. They found that in the arthritis of rheumatism the fluid effusion is usually sterile; that the diplococci are present in the synovial membrane of the inflamed rheumatic joint, but that they are there seized upon by the phagocytic cells, and that the diplococci contained in these cells are so much devitalized that they can no longer be cultivated.

"Why the rheumatic diplococci should cause chorea in children and not in adults; why some rheumatic children should become choreic and others not; and why girls should be choreic three times as frequently as boys, must depend upon differences of individual power of resistance.

"Are we then to say that chorea is 'cerebral rheumatism'? Yes, if we add 'in the great majority of cases.' But we must not make the statement absolutely, for other microbes and other toxins may perhaps affect the cortical cells in the same way as the rheumatic diplococci and their toxin, just as the *Bacillus coli* and the *Bacillus enteritidis* of Gärtner may produce a continued fever resembling that caused by the typhoid bacillus; and, to say nothing of 'senile chorea,' the disease known as Huntington's chorea is found to be caused by multiple organic sclerotic changes in the cortex. It is even possible that the sudden emotional disturbance caused by fright may in some way disturb the nutrition of the cortical cells in a susceptible brain in a way similar to the altered nutrition caused by the rheumatic toxin. Sir William Gowers reminds us that throughout the animal kingdom the emotion of alarm has a direct effect on the motor centres essential to the safety of the animal alarmed. Cases of chorea really caused by fright in the absence of rheumatism are rare, but they probably exist; the difficulty is to prove the absence of rheumatism.

"I desire then to maintain that every case of chorea, however mild, ought to be looked upon as presumably rheumatic. And when we remember the danger of untreated rheumatism in a child, and the heart disease which it so frequently causes, we see how great an injury one may do to a child by neglecting a slight chorea. Many a mitral stenosis in later life, with its distressful years and its premature death, might have been averted if the practitioner who attended the case of slight chorea in childhood had treated it vigorously as rheumatic.

"If, then, in the majority of cases chorea means a brain infected with rheumatic diplococci, surely the treatment which cures rheumatism ought to cure chorea. Yet it is not the general experience that much has been effected in this way. May not this be because the doses given have been too small? If one wishes to cure a cerebral syphilis, large doses of iodide must be employed. Acting on this idea, I have lately given to cases of acute chorea large and frequent doses of sodium salicylate, to which invariably has been added twice the amount of sodium bicarbonate. This addition of alkali I think of great importance, from more than one point of view. In a considerable number of cases this treatment has produced a very rapid improvement. The plan is certainly deserving of further trial in acute chorea. Success seems to depend upon the amount given daily, a further improvement sometimes following each increase of the dose. That the improvement is not due merely to the rest in bed, nursing, and feeding has been proved in some cases by allowing three or four days to elapse before administering medicine. Some cases grow worse if left untreated, others improve slightly.

"The dose of sodium salicylate for a child of six to ten years should be at first 10 gr., with 20 gr. of sodium bicarbonate. After two or three days the quantities should be increased to 15 gr. and 30 gr., respectively.

After two or three days more they may, if necessary, be increased to 20 gr. to 40 gr. These doses should be given every two hours during the day, and every three hours during the night, ten doses in the twenty-four hours. Thus the total amount of salicylate given at first is 100 gr. daily, increased to 150 gr., and finally to 200 gr.

"A careful watch must, of course, be kept for any symptoms of salicylate poisoning, and especially for a peculiar deep inspiration simulating the 'air-hunger' of diabetes. If this occurs the medicine must be immediately given up, for it is a sign of danger. It is, however, a rare phenomenon. There is some reason for thinking that it is really an acid poisoning. The similar 'air-hunger' of commencing diabetic coma may sometimes be arrested by large and frequent doses of alkalies, and the only fatal case of salicylic air-hunger that has come under my own observation had taken the salicylate without any additional alkali. Air-hunger began to show itself in one case which I treated with aspirin, instead of salicylate, without alkalies, and disappeared when the drug was omitted. It seems to me very important that each dose of salicylate should be accompanied by twice as much bicarbonate.

"The unpleasant symptoms sometimes caused by salicylates in adults, the deafness and noises in the ears, the headache, the mental symptoms and delirium, are exceedingly rare in childhood. Occasionally vomiting is troublesome, but it may usually be overcome by suspending the treatment for a few hours and then beginning again with a smaller dose, which should be gradually increased. Pulse failure occurring during the employment of salicylates, both in children and in adults, is generally not due to the remedy, but is caused by an acute rheumatic dilatation of the left ventricle—a common, but usually overlooked, phenomenon in rheumatism. Careful observation of the position of the border of the left ventricle, as ascertained by accurate light percussion, should be made daily. As to any general 'depression' from the salicylate, in children it is usually quite absent; indeed, it has been remarkable how much brighter and more lively the patients have become during the treatment. It should be added that the large doses of bicarbonate do not impair appetite or disturb digestion in rheumatic children, and that, in spite of them, the urine often remains acid for a considerable time. Albuminuria is not caused by the treatment above advised.

"Every choreic child should, I think, be kept for a time completely at rest in bed, however mild the chorea may be. If there is much tendency to excitement, restlessness, or emotional attacks, complete isolation is very helpful. A cot with padded sides is necessary in severe cases, and the most careful and efficient nursing is essential. It may be needful to give in such cases hypnotic drugs, as chloralamide, chloral, or bromide, the first night or two, to secure sleep, but in many cases these can be avoided if large doses of salicylate and bicarbonate are used. The diet at first should be of milk only."

Salicylates in Choreia.—Dr. Henry Ashby said: "I agree with Dr. Lees that the rheumatic toxin is the most important factor in the production of chorea, but I am not inclined to the belief that all cases of chorea are rheumatic. Choreia is exceedingly common in overgrown, anemic girls in whom there is no evidence of rheumatism or of heart disease, and I do not think that in this class of cases salicylates are of much use. The bacteriological evidence is most important and ultimately the question of the rheumatic origin of all cases of chorea will be finally settled by this means. The observations of Dr. Lees on the treatment of chorea by large doses of salicylates are very important. I confess I am some-

what frightened of such doses as he recommends. I am inclined to think that more moderate doses of some 40 to 60 gr. daily are likely to do all the larger doses will, and with less risk. Antipyrin in moderate doses is certainly useful in acute cases. Arsenic is of doubtful value and in large doses almost certainly harmful. After all, rest in bed and careful dieting are the most important essentials in the treatment of chorea."

Serious Cardiac Lesions as a Sequel of Choreia.—

Dr. Theodore Fisher said: "The few remarks which it has occurred to me may be worthy of bringing forward in connection with this discussion, deal chiefly with the question of the frequency of serious cardiac lesions as a sequel of chorea. After two years or more had elapsed from the time of the onset of the acute attack Osler looked up 140 cases, and found in 72 signs of organic disease. Osler mentions also Stephen Mackenzie, who in 33 cases, which were examined after the lapse of two years, found 60.6 per cent. affected with cardiac lesions, and Donkin, who in 44 cases found 18 similarly affected at the end of the same time.

"I have traced 53 cases of chorea that have been under my own care, but have excluded all those in which the time of onset of the chorea was not more than three years before the time of examination. Of these 53 cases, 32 presented no murmurs, with the exception in a few instances of a pulmonary murmur probably due to anemia. Murmurs obviously due to organic disease were heard in 18 instances, and with these must be classed 2 cases which had died obviously of cardiac disease, making 20 in all in which serious cardiac lesions were or had been present. In the fifty-third case a systolic murmur was audible at the apex and another at the base. The nature of the apical murmur was somewhat doubtful. It may or may not have been due to anemia from which the girl to some extent suffered. Of the murmurs obviously due to organic disease, 9 were presystolic, 8 mitral systolic, and in 1 to and fro aortic murmurs were present.

"In passing it may be mentioned that the fact that in only 9 cases a presystolic murmur was audible is a point of some interest. Inflammation of the mitral valve, if it result in permanent defect, almost invariably by degrees produces stenosis of the mitral orifice. Puckering of the mitral valve cusps, allowing regurgitation only, may almost be described as a myth. It is scarcely necessary to remark, however, that a stenosed mitral orifice, with very few exceptions, allows regurgitation, and the systolic murmur due to this regurgitation may not uncommonly be the only murmur heard. Possibly in some of the 8 cases in which only a systolic murmur was heard mitral stenosis may have been present, but that nothing more than dilatation of the left ventricle, in which the mitral orifice shares, need exist in such instances, was shown by one of the fatal cases.

"Osler mentions that in 17 of his cases functional disturbance was present, and in some of these, murmurs which were thought to be probably secondary to anemia were heard. No murmurs, however, may be present after chorea, and yet obvious weakening of the heart may be present. In at least 4 of my cases in which no murmurs were audible, this weakening of the heart, judging from what the boys or girls said of their capacity for exertion, appeared to be definite.

"A point to be considered in connection with the frequency of cardiac lesions following chorea is the occurrence of rheumatism. Of the 32 cases in which no murmurs were heard in only 6 cases a history of definite rheumatism or of pain in the joints could be obtained, whereas in the 20 with cardiac lesions rheumatism had been present in 8. Osler's statistics on this point are very similar. Another question to be considered is whether repeated attacks of chorea are more likely to re-

sult in damage to the heart than one attack. Curiously enough, of 14 of my cases that had only one attack, 7—that is just half—had cardiac lesions, whereas in some in which attacks had been frequent the heart remained healthy. Thus the heart remained healthy in one case where there had been six attacks of chorea, and in another where there had been seven. In 15 of Osler's cases in which there had been three or more attacks, the heart remained healthy. A fact which also seems to me to be noteworthy is that of the 20 cases with permanent cardiac lesions, in 13 I examined the heart when the patient was suffering from the first or only attack of chorea, and in only one of those no apical murmur was to be heard. Some of these last-mentioned details seem to suggest that if the heart escapes during the first attack of chorea it is not likely to suffer during any subsequent attack.

"It is necessary, however, to consider in this connection the importance of murmurs heard during the acute stage of chorea. Murmurs are frequently heard both at the apex and at the base. The basic murmur, which was present in 23 of my cases when they were first seen, is not uncommonly described as hemic, and an associated systolic apical murmur may be considered to be of the same nature. It is not necessary, however, to conclude that these murmurs, when heard in cases of chorea, have any connection with anemia. A loud pulmonary murmur can certainly occur when there is no anemia, and may be so loud that, when conducted to the right of the sternum, it may be mistaken for an aortic systolic murmur. Not long ago I was calling upon a medical friend, who took the opportunity of telling me that he had a case of dyspnea, of sudden onset, in which I might be interested. On examination of the chest a loud and widely-conducted basic systolic murmur was found to be present, which my medical friend thought was aortic. Considering, however, the murmur to be pulmonary, not aortic, and believing as I do in Dr. Foxwell's explanation of the pulmonary systolic murmur, I thought the main abnormal condition of the heart was dilatation of the right ventricle. A few days later a necropsy proved that my suggestion was correct, and that the aortic valve and aorta were quite healthy. In another similar case, where a strong healthy sea captain was seized with sudden dyspnea, and a loud basic murmur was audible, after death the aortic valve was found free from disease, and the cause of the cardiac failure proved to be a gumma of the septum ventriculorum. Pulmonary systolic murmurs present in cases of chorea are with little doubt an indication of some dilatation of the right side of the heart, and systolic apical murmurs generally an indication of dilatation of the left side. The dilatation may as reasonably be attributed to the action of micro-organisms or of toxins upon the heart muscle as to anemia. Opportunities of examining the cardiac muscle in fatal cases of chorea in which pericarditis is absent are not common. Recently, however, I have had such an opportunity. Microscopical sections of the cardiac muscle stained with Sudan iij and hematoxylin displayed very definitely the presence of fatty degeneration of widespread character. Commonly, fatty degeneration, especially that associated with anemia, affects some muscular fibers more than others; but in this case, although in none the degeneration was extreme, every fiber in all the sections examined was dotted throughout with small granules of fat, the distribution being for the most part uniform, except that in many fibers the fat granules were most numerous in the neighborhood of the ends of the muscle-nuclei.

"It should be added that whether a systolic apical murmur heard during the acute stage of chorea be allowed or not to be due to a toxic condition of the car-

diac muscle causing dilatation of the heart, it is interesting to note that in many instances the murmur disappears. This happened in 12 of my cases. In most of those, it is true, the systolic murmur was not very well marked, but in 3 it was described as high-pitched. Curiously enough, however, in another case, one of those included in the 20 with cardiac lesions, the girl was examined a few weeks after she had recovered from her first attack of chorea, when a high-pitched systolic murmur which had been present was found to have disappeared; yet when the girl was examined nearly seven years later a loud and widely-conducted systolic murmur was audible. There had, however, been another attack of chorea.

"Osler's large number of cases gives a higher percentage of serious cardiac lesions following chorea than my own; but Donkin's series gives results approximately similar. Osler's cases show a percentage of just over 50 per cent. of cardiac lesions, Donkin's, however, only a fraction over 40 per cent., and mine a fraction under 40 per cent. The smaller number of cases of Stephen Mackenzie, however, gives as high a percentage as 60.6. Roughly, perhaps, we may say that about half the patients who suffer from chorea will be found within a year or two to be suffering from cardiac disease, which can be detected upon auscultation. It should be borne in mind also that in a few cases in which no murmur can be heard the heart has probably been weakened by disease of the myocardium.

"In considering the probability of heart disease following chorea, it is well to remember, however, that when there is no history of rheumatism the likelihood of damage to the heart is comparatively small. It appears, also, that if no signs of affection of the heart can be detected during the first attack of chorea the heart will probably not suffer during any subsequent attack.

"It must not be concluded, however, that apical murmurs heard during the first attack are necessarily permanent. Systolic murmurs will disappear, and it is scarcely necessary to add that the dull diastolic sound so commonly heard over the hearts of children temporarily enfeebled from various causes, must not be considered as the precursor of a presystolic murmur, though, of course, in later years in some instances a presystolic murmur will be found to be present."

Citrate and Iodide of Potassium.—Dr. William Ewart said: "I think that the hesitation I share with many in prescribing large doses of salicylates, in the absence of obvious rheumatic symptoms, might be best overcome if Dr. Lees could supply evidence that they availed to curtail the duration of the attack. The frequent occurrence of slowing of the heart's action is an argument for avoiding overdoses. May not some of the good results noted have been due to the anodyne effects of the large doses of sodium bicarbonate? The efficacy of carbonic acid in relieving spasm and nervous distress is well known, whether the gas be inhaled, injected into the rectum, or disengaged in the stomach from its watery solutions or its salts. I have long discarded the combinations with the salicylates of the alkaline bicarbonates in large and frequent doses in rheumatic fever, because of the danger of setting up permanent gastric dilatation from the constantly recurring distensions with carbonic acid gas. I prefer to use the citrate of potassium, and invariably administer the iodide also, as suggested by Dr. R. Caton."

Dr. G. J. C. Thomson asked why large doses of the salicylates should not be given as soon as the patient came under observation, just as in rheumatic fever, in order to get the patient quickly under the full influence of the drug.

Pathology of Choreia.—Dr. F. J. Poynton said: "It is chiefly upon the pathological aspect of this question

that I wish to speak a few words. I think we must maintain a philosophical attitude of mind in the study of chorea and recognize that positive facts are of greater value than negative, for there are great difficulties in such a study, because of the rarity of fatal chorea and because it is a condition which is liable to be considered from one point of view. Either by the neurologist as a nervous disease or by the bacteriologist with the aim of obtaining cultures. It is difficult to get both points of view studied, and the cases in which this has been done are comparatively few.

"Such facts as we have at present I would briefly tabulate thus:

"(1) Micro-organisms of the streptococcal group have been isolated from rheumatic fever. (2) They have been isolated from the cerebrospinal fluid and brain itself in chorea. (3) They have been demonstrated in the pia mater and brain. (4) Involuntary movements of a peculiar type have been recorded by Paine and myself and F. Meyer as resulting from intravenous inoculation of rabbits with such micro-organisms. (5) Identical bacteria are found in other rheumatic lesions in man, and are capable of producing the lesions of rheumatism in animals. (6) Chronic leptomenigitis has been noted in chorea by Dana. (7) The lesions found after death in acute chorea are such as one could explain on the view of an infection. I mean the minute thromboses and hemorrhages, occasional embolism, degenerative changes in nerve cells, and perivascular exudation commented upon by Dr. Lees."

Hyperpyrexia in Choreia.—Dr. Edmund Cautley said: "I have never yet met with a case of hyperpyrexia in chorea. Certainly if it occurs at all it is very rare. This may be urged as an argument against the view that chorea is 'cerebral rheumatism,' even though modified by the words 'in the great majority of cases.' In the worst cases, those in which there was much insomnia and excessive movements, I have obtained very good results by the frequent administration, every two or three hours, of small doses of chloral hydrate."

"Air-hunger" in Choreia.—Dr. George Carpenter said: "I wish to ask Dr. Lees his explanation of 'air-hunger,' and whether he has made any observations upon the blood in cases developing this symptom. I have found that salicylate of soda in excessive doses induces destruction of the red blood corpuscles in some instances. I have seen one instance of fatal hyperpyrexia in a choreic child, aged three years. I desire to call attention to the danger of arsenical multiple neuritis in unwatched cases, and I have seen several cases of shingles in those treated by arsenic. Albuminuria may also be produced. I do not regard arsenic as of much value in the treatment of chorea, and trust more to antipyrin. The latter drug sometimes produced measly and urticarial eruptions. The urine must be watched, for antipyrin in some cases gives rise to considerable albuminuria."

Chorea Ascribed to Fright.—Dr. Michael O'Sullivan said: "During the period of my connection with a children's hospital in Dublin I have had under my care 54 patients suffering from this disease. Forty-one of those were girls, whose ages varied from five to twelve years (the latter being the limit of age for admission of girls to hospital), and of boys there were only 7, whose ages were from five to ten years (the high limit for boys). The onset of the disease was, in a number of cases, ascribed to fright, such as being attacked, but not injured, by a dog, or in different other ways. The spasmodic and involuntary movements supervened after two or three days in most cases. On examining into the previous history of these children I found in most of them a rheumatic history of some sort. In some there was an account of rheumatism in the parents,

which, so far, had not shown itself in some of the children. In others there was a distinct history of the patient having had a genuine attack of rheumatism, and others complained of growing pains, which I consider are closely associated with a rheumatic tendency. Again some of the patients had rheumatic attacks during the progress of chorea. Of the various cases I have had under my care 50 per cent. had well marked organic murmurs, very few of which disappeared with the disease. I have, however, seen two undoubted cases of mitral regurgitation which got quite cured as the choreic symptoms passed away. Patients who have been without murmurs on admission have, however, often developed them during the progress of the disease, and these generally pursued the same course as the others. The lesion I have found most common in those cases of heart disease is mitral regurgitation.

"The various symptoms of chorea are too widely and thoroughly known to require recounting. There is one item which I have never seen mentioned by any author, and I myself have commonly observed in cases of chorea, and that is the large size and more or less flabby condition of the patients' tongues. I may say I rarely see patients without that condition of tongue. I had once a peculiar case of chorea (temporary) under my care. This was an attack which followed a rather prolonged administration of nitrous oxide gas, and lasted only about an hour. This patient was a girl seventeen years of age.

"The treatment which I adopt in almost every case is a combination of rest to mind and body. To prevent children learning lessons, and removing them from surroundings which might be too exciting, and capable of giving rise to frights and emotions. Warm baths are very useful, and easily digested nutritious food is absolutely necessary. Patients who are very violent should have their beds padded, and should be carefully watched that bedsores may not occur.

"With regard to medicinal treatment, I may say arsenic is practically the only drug I use. I prescribe it in 10 to 15 minim doses from the beginning, well diluted with water, and given during meal times. This occasionally disagrees with the stomach, and should then be discontinued for a time, when it will generally be found that the gastric disturbance will not recur on the readministration of the drug. In severe cases I prescribe chloral, and have on occasions given chloroform by inhalation. When chorea is complicated by rheumatism I always advise salicylate of soda."

Dr. J. R. Logan said: "Although shingles occurs in choreic patients taking arsenic, it is not always due to the drug, and may depend upon some trophic influence of the affected nervous system. I have seen well-marked herpes zoster in a child, with chorea, who was not taking arsenic."

Dr. Lees, in closing, drew attention to the necessity for sufficiently large doses of salicylate in the treatment of rheumatism and chorea. If the dose were too small, the desired results would not be obtained, and if the dose were too rapidly reduced there was the greatest probability of relapse. He related cases in illustration of this. He had seen one fatal case of hyperpyrexia in a choreic child.

The Relation of the Thyroid Gland to Marasmus.
—Prof. John Ruhrah, of Baltimore, said: "The pathology of infant life has been to a certain extent a very much neglected field, and I feel positive that a rich harvest awaits the workers who will be painstaking enough to study both in the ward and in the deadhouse. In most places the necropsies on infants are hastily done, and the record frequently made in the report, 'Nothing abnormal noted.' As a matter of actual fact regarding many organs during infancy there are few who know normal

from abnormal or who can tell from a microscopical examination what the microscope will reveal. There are, I am sure, clinical entities with well-marked lesions which are waiting to be described.

"As you all know, one frequently sees an infant sick and die without diagnosis during life, and no adequate explanation after the necropsy has been made. Many of these cases come under the head of marasmus, and it was with the intention of trying to throw some light on this interesting condition that especial care was taken with our necropsies on infants. The following brief report, which I hope will stimulate others to undertake similar studies, is based on about 85 necropsies. The first 23 have been carefully tabulated by my colleagues, Dr. Stokes and Dr. Rohrer and myself, and while the remainder have not been tabulated they have been studied, and the conclusions reached from the first twenty-three remain unchanged.

"It is a curious fact that the most characteristic lesions of marasmus, excepting the wasting of fat and muscles, while known for many years, is not mentioned in any of the text-books on the diseases of children. This lesion is a wasting of the thymus gland which will be described later.

"Parrot, in 1877, called attention to the disease which he called *athrepsia*, the so-called wasting disease of infants, known also as *marasmus*, simple atrophy and *atrophia primitiva infantum*. The term *inanition*, also used, should be restricted to those acute cases of starvation which have a typical course and characteristic symptoms.

"There are two conditions in which we see atrophy in infants. The primary cases, where the cause is as yet unknown and those following definite pathological conditions, or the secondary cases. The dividing line cannot at this time be definitely drawn. All cases occurring in the course of the easily recognized diseases may at once be placed in the group of secondary cases, those following tuberculosis or syphilis for example. Clinically most cases are seen in infants which have had improper food and care. Some authors would also place these in the list of secondary cases. They would place under the head of primary atrophies only those where the assimilation was at fault; or, in other words, those cases receiving proper care and a physiologically correct diet. This is, we think, a division practically useless; and for the present until we have definite information the cases should be divided, on a pathological basis, into those where there are lesions of definite diseases, and those where there are no special and constant lesions except the wasting of the muscles and the body fat, and as we shall see of the thymus gland as well.

"We may safely assert, I think, that the trouble is not due to the amount of food ingested nor to the amount absorbed from the intestinal tract, but that it is due to malassimilation of the food material in the body. Whether the thymus gland has anything to do with assimilation or not we are not prepared to say, but it is certain that the thymus gland bears a direct relation to the state of the nutrition of the body. It increases in size until about the second year, when it remains stationary, growing relatively smaller when compared to the size of the growing body. At puberty, when the body growth is largely over, it begins to atrophy and at about twenty-five years of age, when the body has attained its full growth, it is gradually replaced by fatty and connective tissue.

"Herard, at a subsequent date Friedleben, and more recently Mettenheimer, have pointed out the relation of the size of the thymus to the state of nutrition of the body. Of this there can be no doubt, as it rests on a firm basis of trustworthy observation. The function of the thymus is as yet unknown, and the limited time at

my disposal prevents my even mentioning the observations and theories concerning it. The thymus gland weighs about 12 grams at birth. Histologically, it consists of a connective-tissue framework, holding up a parenchyma consisting of a cortex and medulla, which are similar in structure, but the cortex contains normally many more cells than the medulla. The parenchyma consists of a network of endothelial cells resembling the reticular spaces of the lymphatic structures. This space is filled with lymphoid cells, and also with a few neutrophilic and eosinophilic leucocytes, and with a few giant cells. Here and there in the structure are little islands of epithelial cells with a peculiar concentric arrangement not unlike that found in the concentric bodies of an epithelioma. These are the so-called Hassal bodies or corpuscles. They are the remains of the epithelium, which forms the principal part of the thymus gland during embryological development.

"Our studies cover 18 cases of marasmus. The average weight of the gland was 2.2 grams. Excepting the terminal infection, the atrophy of the thymus was the only lesion found in any of the autopsies. The changes in the gland consisted in a great atrophy. Histologically, the fibrous capsule of the gland is thicker than normal, and the trabeculae are also greatly thickened, and the increased interlobular tissue frequently cuts the lobules up into irregular masses. Sometimes there is more fibrous tissue present than there is lymphoid structure. In well-marked cases there is more reticular tissue present than lymphocytes and leucocytes. In most of the cases there was an increase in size and a hyaline degeneration of the Hassal bodies.

"The state of the nutrition of infants may be estimated by a microscopical examination of the thymus. In those of normal infants the structure of the thymus is unaltered, and the differentiation between cortex and medulla is plainly visible. In moderate atrophy the cortex and medulla are not easily distinguished, while in severe atrophies the changes mentioned above are plainly seen.

"In secondary atrophy the change is one of degree, and we found in our cases the average weight of the thymus to be 3.41 gram.

"We tried the administration of the thymus gland tablet in cases of marasmus, and as far as could be determined there were no changes produced by the use of the gland in the dried form. We arrived at the following conclusions: (1) Atrophy of the thymus gland is always found in cases of infantile atrophy. (2) The condition of the thymus is an index of the general nutrition of the infant. (3) The state of the nutrition in infants may be estimated by a microscopic examination of the thymus at autopsy."

Dr. F. J. Poynton, in the discussion, asked Prof. Ruhrah's opinion upon a remarkable condition in children. Roughly, the symptoms were (1) enlargement of the thymus, even giving rise to a dulness behind the manubrium, (2) paroxysmal cough, (3) sudden death. These cases had been long recognized, but whether or not the symptoms were dependent upon the condition of the thymus was uncertain. He did not remember any relation between the size of the thymus and the condition of the body in these cases. They were very dangerous cases, and he raised the question because he would like to hear the experience of Prof. Ruhrah in this matter.

Dr. H. Ashby asked the writer of the paper for any observations he had made on "thymus death." In some of these cases the infants were well nourished and perfectly healthy, without any signs of rickets. Death occurred suddenly, and at the necropsy an enlarged thymus was found.

Dr. W. Ewart, in connection with the mode of causa-

tion of so-called "thymus death," called attention to the probability that the enlargement of the gland was not the only cause. Some other factor, such as pulmonary congestion or gastro-intestinal distention, of a more sudden nature, must be admitted. But the chief factor was, in his estimation, the individual cardiac weakness, which, in the adult, showed itself in the tendency to fainting and to sudden death.

Dr. George Carpenter was no believer in the condition of thymic asthma or of sudden death from an enlarged thymus. He had seen cases of enlarged thymus which did not produce any symptoms. He had also seen cases of tuberculous disease of the thymus which produced mediastinal tumors diagnosed during life, and which did not induce thymic asthma or sudden death. An enlarged thymus was a well-known physiological condition of infancy, and it did not produce clinical symptoms. He had no doubt in his mind that thymic asthma and sudden death in some cases were due to post-nasal catarrh, sometimes in association with adenoids, a condition which was not recognized and which he drew attention to. He called attention to a fact that should be widely known that digital examination of the nasopharynx produced in some instances a cough indistinguishable from whooping cough, and that it also produced spasm of the larynx. His firm conviction was that so-called thymic asthma and sudden death from the thymus were in many instances in reality due to spasm of the larynx, which in the fatal cases did not relax. Thymus death was often death from laryngismus stridulus, and the sooner this was recognized the better. Pay more attention to the nasopharynx and thymic asthma will be a less fashionable explanation.

Dr. R. B. McVittie asked if the atrophic conditions of the thymus were, in Professor Ruhrah's experience, in any way associated with syphilis. In the cases which he had seen of sudden death, which would be likely to be attributed to what was called thymic asthma, the children were always very stout. It seemed to him most probable that they were cases where the heart was likely to be constitutionally feeble and easily stopped by some comparatively trivial circumstance, such as laying the child down after a full meal.

Dr. Theodore Fisher said the position he had always taken up was that in cases of sudden death the children were better nourished than those dying of chronic disease, and a normal thymus was consequently thought to be enlarged. He thought, in most of the cases, death was due to laryngismus stridulus, though evidently the case mentioned by Dr. Ewart would not come under that heading.

Dr. Ruhrah, in closing, said that as regards thymic asthma and thymus death he had had no personal experience. There were undoubted cases of thymus death, but he was inclined to think that some of those reported were due to other conditions, and that the normal thymus seemed unusually large, as the atrophied thymus was the one with which most of them were familiar. In one case which he observed the child died rather suddenly with convulsions and edema of the lungs. Quite a large thymus was found, but about a quart of potato salad was found in the intestinal canal. His investigations were undertaken with the idea of throwing some light on the pathology of marasmus, with hopes of finally finding some therapeutic measures of value.

The Age for Operating in Cleft Palate.—Dr. R. W. Murray said: "There is a considerable difference of opinion among surgeons as to the most suitable age for operating for cleft palate. Some delay operating until the child is between three to six years of age; others, again, operate during the first few weeks of life.

"In the case of a child born with a cleft palate there can be no doubt, from a purely theoretical point of

view, that the sooner the cleft is closed the better; at the same time, 'it is often wise to effect a compromise between that which is theoretically most desirable and that which is practically most advantageous, things being as they are.' The main object with which an operation for the closure of a cleft of the palate is undertaken is that the powers of speech may thus be rendered more perfect than they otherwise would be. If the operation is postponed until the fourth or sixth year of life, the child has then learned to talk, and necessarily to talk badly, a habit once acquired very difficult to overcome completely. At the same time, it must be remembered that the defective power of articulation in these cases depends upon other factors than the mere gap in the palate. I would particularly draw your attention to the fact that, if the cleft involves the bones of the hard palate, articulation will never be perfect, even though the child has been operated upon early in life, and the operation successfully performed. For example, if a child has a simple hare-lip, the alveolar margin and the palate being perfectly formed, the subsequent powers of speech will be in no way affected. But if as well as a hare-lip there is a slight notching in the alveolar margin (not, of course, amounting to a cleft palate), then, however early and however perfectly the deformity of the lip may be operated upon, the child will always talk with a lisp. The same holds good in regard to the posterior structures of the palate. If the cleft involves the whole of the soft palate, but does not include the hard palate, then, provided the cleft is closed before the child has learned to talk, there will be no noticeable defect of speech in after years. But if, on the other hand, the bones of the hard palate are involved, then, in spite of an early and successful operation, there will be a permanent defect in articulation, though this defect will not necessarily be directly proportionate to the amount of the bony deformity.

"The explanation, I believe, is that when the cleft involves the hard palate or alveolar margin, this defect in development is not limited to the structures of the mouth but also includes the nasal chambers, which are so largely concerned in the production of the voice, and therefore the imperfect articulation so characteristic of persons born with a cleft of the hard palate persists even though an operation for the closure of the cleft has been successfully performed. As further confirmation of this view that the cleft in the palate is not entirely responsible for the nasal character of the articulation, one has only to remember that from time to time we see children who speak as if there was a cleft of the palate, but on examining the mouth the only defect noticeable is that the palate is very highly arched, thus encroaching upon the nasal chambers. I believe this to be the explanation of the defective articulation in these cases, a condition which one could not hope to remedy by any operation upon the highly-arched palate. If then it is true that provided a cleft of the soft palate is closed before the child has learned to talk, the result, so far as speech is concerned, will be perfect, it necessarily follows that the operation for the closure of such a cleft should take place somewhere between the time of birth and say the end of the second year, always provided, of course, that the health of the child will permit of it. For my own part, I have no hesitation in saying that within this age limit the later the operation is performed the better.

"I know there are surgeons who hold different views, and who advocate and practise closure of the cleft during the first few weeks of life; in fact, in a case of hare-lip and cleft palate they operate upon the palate before operating upon the lip. In my experience this is a mistake, for every one will surely admit, other things being equal, the older the child the easier the operation,

and, so far as a cleft of the soft palate only is concerned, I am convinced that a perfect result as regards articulation may be obtained provided the operation is performed about the end of the second year, and nothing better than this can be hoped for by operating during the first few weeks of life. On the contrary, during the first few months of life the tissues are so friable and the amount of material out of which to make a soft palate with so scanty, that after paring the edges there is very little soft palate or uvula left. This is a matter of considerable importance, for, I believe the ultimate result in respect to articulation largely depends upon a good and freely movable soft palate.

"When, as is usually the case, there is a complete cleft both of the lip and of the palate, I operate upon the lip when the child is about three or four weeks old, and delay operating upon the hard and soft palate until about the end of the second year. It is quite remarkable how the closure of the lip influences the subsequent growth of the hard palate. I have noticed in a large number of cases where at the time of the hare-lip operation the gap in the alveolar margin of the palate has been considerable, that several months after the closure of the lip the alveolar gap has practically disappeared. This is to my mind a strong argument in favor of delaying the operation upon the palate, for the narrower the cleft, the easier the operation and the greater the probability of success. In this class of case, however, where the hard palate is involved, the subsequent powers of articulation, for reasons I have already mentioned, will always be somewhat defective. If, on the other hand, the soft palate only is involved, the prognosis is much more hopeful. I know of several children upon whom I operated for cleft of the soft palate before they could talk, and these children now articulate quite naturally, it being impossible to detect from their speech that they ever had cleft palates.

"I would emphasize the importance of training these children after operation to articulate correctly; they have the greatest difficulty with the 's' and the 'th,' and the plan I usually adopt is to get the mother to teach the child some nursery rhyme as 'Seesaw, Margery Daw,' and ask the child to repeat it to me from time to time."

Mr. Arbuthnot Lane, in discussing Dr. Murray's paper, said that he operated as early in life as possible—indeed, he preferred the day after birth. He gave the following reasons for this procedure: (1) That the nasopharynx was sooner exposed to the influence of the mechanical factor upon which its development depended; (2) that the operation was much easier at this age and more certainly successful, because of the absence of teeth and the much greater flap obtainable; (3) the child being in good condition it repaired well, and it displayed no irritation or annoyance whatever because of the operation.

Dr. H. Ashby asked the President for his experience in tracing in after-years the progress in articulation of those infants operated on during the first few weeks of life. There could be no doubt that those operated on when five or six years old talked with a nasal twang for many years, and required long training.

Dr. F. J. Poynton wished to know if the risk to life was not a real factor in operating upon a child under a week old. This was a most vital point. A dead child with a palate closed was a tragedy. The operation was a decorative, not a vital one. He would like to know from Mr. Murray and Mr. Lane if the dangers to life were not a reality in the first week of life.

Discussion on Congenital Dislocation of the Hip.
—Dr. F. F. Burghard said: "Although the subject of congenital dislocation of the hip has been one of much interest to the profession ever since the publication of

the work of Hoffa and Lorenz, there has been an increased activity in the matter within the last two years, which is largely due, no doubt, to the use of the X-rays, whereby results can be accurately checked and vague general statements replaced by precise observations. Extended experience leads me to confirm the view that I enunciated in a paper read before the British Medical Association in 1901, that certain cases are more suited for one method and certain for the other, and that careful discrimination is needful to ensure success in treatment."

Anatomical Changes Met with in Congenital Dislocation.—"In order to arrive at a just conclusion as to the best method of treatment it will be well to mention briefly the various anatomical changes met with.

"The most pronounced and invariable change, and one that is present from the earliest period of life, is found in the acetabulum; it is also of primary importance in the treatment of the affection. Instead of being the normal hemispherical cup looking downward, outward, and forward, it is a shallow triangular depression looking almost directly outward, and with its apex directed upward. Moreover, its upper margin, which in the normal joint plays a prominent part in retaining the head of the bone in the acetabulum, is very defective, and is quite incapable of exerting any retentive function. It is this shallowness of the acetabulum that renders easy the relaxation that so often occurs after an apparently successful reduction of the dislocation.

"Another point of the highest practical importance, and one that does not seem to have hitherto attracted its due amount of attention, is the arrangement of the capsule of the joint and the changes that different portions of it undergo. It serves to explain a number of cases in which the 'bloodless method,' although apparently successful at the time, fails eventually, and dislocation recurs a few days or a few weeks after the operation. An examination of museum specimens and an extended experience of the open operation has impressed upon me the great importance of this anatomical factor. Attention was first called to the matter by Hoffa, and its importance has been more recently emphasized by Bradford and Nicholls. The following account, translated from Hoffa's well-known work on Orthopedic Surgery, puts the matter concisely.

"The capsule rapidly undergoes alterations in shape and assumes a somewhat hour-glass form. Starting from the posterior edge of the acetabulum it passes over the head of the bone, over which it is accurately applied, so that the outline of the head can be seen clearly beneath it. It then runs forward and downward and becomes firmly adherent to the acetabulum, so as to make with this flattened cavity a narrow pouch, the so-called 'acetabular pocket' of Lorenz, from which the ligamentum teres, when present, emerges to reach its insertion into the head. This lower portion of the capsule thus forms a sort of diverticulum which only communicates with the upper spacious capsular cavity, in which lies the head of the bone, by an isthmus, the so-called *rétrécissement* of Bouvier. This narrowing is really caused by the passage of the iliopectineal tendon across the capsule at this spot. It is not in this form only that the capsule undergoes changes; its consistence also alters. The entire anterior and inferior portion becomes abnormally thickened, so that the portion lying like a lid over the acetabulum becomes exceedingly dense and unyielding. In this the various capsular bands, and especially the Y-ligament, play an important part."

"These changes in the structure and arrangement of the capsule have a twofold action in preventing a true cure of the dislocation. In the first place it may be impossible to cause the head of the bone to pass beneath the lid formed by the anterior part of the capsule and

lie truly in the acetabulum without some open operation accompanied by detachment of the capsule from the acetabulum. In the second place this capsular lid may become interposed between the head of the bone and the acetabulum in cases in which the bloodless reduction is apparently successful, and this will lead to such an unstable joint that relaxation will readily recur. That this is the true explanation of some of the failures of the 'bloodless method' I have been able to assure myself when practising the open operation; it has apparently been possible to reduce the dislocation by manipulations, but examination by the finger in the wound has shown that the head of the bone has merely been made to lie over the acetabulum, the thickened anterior wall of the capsule forming a dense partition between them. In other words the case is one of spurious reduction.

"Nor are the changes that occur in the femur of inferior importance. Foremost among these is the increase that occurs in the angle made by the long axis of the neck of the femur with the transverse axis of the femoral condyles. In the normal subject this angle varies between 15 and 25 degrees, but in every case of congenital dislocation it is increased, and may be as great as 80 or even 100 degrees. This torsion of the femoral neck generally takes place in the forward direction, so that, when the head is properly in the acetabulum, the entire lower limb is rotated more or less strongly inward, according to the extent of this so-called 'angle of femoral torsion.' It is said that this torsion may be so extreme in adults as to require an osteotomy to remedy it. Personally, I have only found it very marked in three cases; in two it yielded to well-applied traction and movements, but in the third case—which is still under treatment—the torsion is very extreme, being, as nearly as I can judge, quite 90 degrees. These three cases are all young children.

"Another very important change in the femur is the alteration in the angle made by the neck with the shaft. The normal angle is about 120 degrees, varying between 110 and 140. In cases of congenital dislocation, however, it undergoes diminution, and may be as small as 90 degrees. The diminution is slight before the child begins to walk, and its degree is to some extent proportionate to the length of time that has elapsed after the child has learnt to walk.

"The changes in the head of the bone itself are rarely marked, except when the dislocation has persisted untreated for years. In early life the head is rather diminished in size, and its general outline is somewhat pyramidal from flattening of its inner aspect against the outer surface of the ilium, but it is only when the dislocation has lasted for several years that the irregular mushroom-shaped head described in the text-books is seen.

"The alterations in the ligamentum teres are various. As a rule it is absent altogether; when present it is always elongated and often very thin. The changes that take place as growth progresses are not constant either in kind or in degree. The most important alteration—and one that is very common as far as my experience goes—is a change in the anatomical variety of the dislocation; that is to say, a dislocation which in early life is a true dislocation upward becomes, as life advances, a dislocation upon the dorsum ilii. When this occurs there is the characteristic loose joint, the extreme waddle in walking, and increased shortening. The acetabulum always gets shallower as the child gets older, and at the age of sixteen I have found it barely perceptible to the finger when the joint was cut down upon. It invariably remains, however, as a shallow but quite definite depression throughout life. The diminution in the angle made by the neck of the bone with the shaft increases, and the head assumes the typical

mushroom form. The anterior portions of the capsule become still more shortened and thickened. It will thus be seen that there is a definite reason for the admittedly great want of success in the treatment of cases that have been allowed to reach some age before the affection is taken in hand. At the age of puberty the anatomical changes are so advanced that it may be mechanically impossible to get the head of the bone into the normal position in the acetabulum. The usual result of untreated cases is a large, loose, sliding joint between the head of the femur and the outer surface of the ilium, with its concomitant deformity, although the case reported by H. Morestin shows that a perfectly stable, though imperfect, joint may occasionally arise even without treatment of any kind.

"The form of dislocation met with in practice varies somewhat according to the age at which the patient comes under notice. It seems to be the general impression that there is a true dorsal dislocation in the majority of cases, the head of the femur moving freely over the outer surface of the ilium. This is no doubt the case in the older children—those, for instance, over six years of age; but in my experience the common form of dislocation seen in young children, and probably the almost universal form at a very early age is a true dislocation upward beneath the anterior superior iliac spine, the so-called 'supracotyloid' form. This form of dislocation is, however, an unstable one, and, as age advances and the weight of the body increases, it is apt to become transformed into the common dorsal dislocation, the head passing on the dorsum of the ilium. There is yet a third form that is occasionally met with; here the head of the bone passes upward and backward, and occupies a position above and behind the normal acetabulum intermediate between the two varieties just described. This variety is very unstable indeed, and soon becomes transformed into the true dorsal form. There is much less interference with the normal gait when the dislocation is directly upward, and it is these cases that are often overlooked.

(To be Continued.)

BOOK REVIEWS.

REFERENCE HANDBOOK OF THE MEDICAL SCIENCES. Embracing the Entire Range of Scientific and Practical Medicine and Allied Science. By various writers. A New Edition completely Revised and Rewritten. Edited by ALBERT H. BUCK, M.D., of New York. Vol. VI, Mos-Rye. William Wood & Co., New York.

THE present volume contains an immense amount of material, well systematized and thoroughly up to date. We cannot add much to our previous encomiums of this work, save to repeat that we know of no single work of reference which in any way compares with this "Reference Handbook." It is a veritable *vade mecum* and, the reviewer believes, should be found in the library of every wide-awake practitioner of the country.

Articles of special interest are numerous. We might signalize some for special mention. Thus the article on Muscles with Muscular Dystrophy; a consideration of the subject of Nasal Cavities with their attendant diseases; the article on Naval Hygiene, which is remarkably full, as is also the article on Nematodes might be chosen. The general consideration of Nerves, Nervous Injury, Neurology, Neurasthenia, Neuritis, Neuromes and Neuroses is thoroughly modern and complete.

A very interesting article is one on the relation of Occupation to Disease, and we do not know where we have seen an article on Diseases of the Esophagus so well considered from all points of view as that in the "Reference Handbook." The discussion of the Ophthal-

moscope is too full even for a specialist. Organotherapy, Pain, Pancreas, Paralysis and its related phenomena are all well considered. There is a very excellent plate on the Eggs of Human Parasites, a better collection than we have seen anywhere. Other sections worthy of mention are Perineum, Phagocytosis, Pharmacopoeias, Placenta, Plasmon, Poisonous Plants, Poisonous Reptiles, Poisons, Premature Infants, Quarantine, Recruits, Reflexes, Refuse Disposal, Reparative Surgery, Resection of Joints, Rheumatism, and Roentgen Rays.

As this excellent book nears completion, its masterly character becomes more and more evident and we hope for it the wide popularity that the work of both editor and publisher deserves.

THE PRAXIS OF URINARY ANALYSIS. A Guide to the Chemical Analysis of Urine, with Directions for Preparing Artificial Pathological Urines for Practising the Various Tests and an Appendix on the Analysis of Stomach Contents. By Dr. LASSAR-COHN, Professor in the University of Königsberg. Authorized Translation from the Author's Enlarged and Revised Second Edition by H. W. F. LORENZ, A.M., Ph.D. (Berlin). John Wiley & Sons, New York.

THIS booklet of 56 pages contains only what is absolutely essential for the chemical analysis of the urine; it being the intention of the author to make the subject appear in its simplest form and to avoid confusing the beginner with many tests. An equally brief chapter on stomach analysis is appended. The volume seems to be intended more for pharmacists, as the microscopical examination of urine is not touched upon and the physician would really have to resort to another treatise for a complete analysis. An original feature is the preparation of artificial pathological urines for practising the various tests.

POST-MORTEM PATHOLOGY. A Manual of Post-Mortem Examinations and the Interpretations to be drawn therefrom. A Practical Treatise for Students and Practitioners by HENRY W. CATTELL, A.M., M.D., Pathologist to the Philadelphia Hospital and the West Philadelphia Hospital for Women, etc. J. B. Lippincott Company, Philadelphia and London.

WE have long felt the want of a good English book on gross pathology, and those of us who are obliged to do pathological work have always been conscious of how poor our own literature is in books on this subject. The volume before us cannot be recommended too highly; it stands on the same level with Orth's and Nauwerck's works, and should not be missing in any hospital library. After chapters on General Consideration, Records and Note-taking, Post-Mortem Instruments and Their Use, and Care of the Hands, Virchow's and Orth's Methods of Performing a Complete Autopsy described in full with such modifications as law and custom in this country demand. Then the various organs are taken up in detail and their different pathological conditions described most graphically. New and original suggestions and practical hints abound everywhere. The restoration and preservation of the body is not neglected and in the chapter on the preservation of tissues for microscopic and macroscopic purposes, the methods of Kaiserling and Pick, so commonly employed in Germany at present, receive a detailed description. Comparative post-mortems, medicolegal suggestions and Prussian medicolegal post-mortems are each discussed in a separate chapter, and appended to the book there is a list of usual causes of death with synonyms. Last but not least, mention must be made of the numerous excellent illustrations in this volume; they are remarkably clear and illustrate the various steps so much better than words.